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THE ILLUSTRATED ANNUAL REGISTER OF RURAL AFFAIRS FOR 1880.

110 ENGRAVINGS.

ALBANY, N.Y.
Luther Tucker & Son.
No. 26.

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REGISTER OF RURAL AFFAIRS

AND

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FOR THE YEAR 1880,

CONTAINING

PRACTICAL SUGGESTIONS FOR THE FARMER AND HORTICULTURIST.

With nearly 120 Engravings.

BY J. J. THOMAS.

AUTHOR OF THE 'AMERICAN FRUIT CULTURIST,' AND 'FARM IMPLEMENTS;'
ASSOCIATE EDITOR OF THE CULTIVATOR & COUNTRY GENTLEMAN.

ALBANY, N. Y.:
LUTHER TUCKER & SON, 395 Broadway.
1880.

PUBLISHERS' ADVERTISEMENT.

THE ILLUSTRATED ANNUAL REGISTER OF RURAL AFFAIRS has now reached its Twenty-Sixth year, under the continuous Editorial charge of Mr. JOHN J. THOMAS, to whose thorough practical knowledge of the various topics it has embraced, with assistance from other accomplished writers on special subjects, its readers have been indebted for the most comprehensive and concise series of papers in the different branches of Rural Economy, within the whole range of our agricultural literature. The profuse illustrations from the pencil of the Editor, by which they are accompanied, give special attractiveness and value to the work, for which most of them are especially drawn and engraved; and the reading matter is wholly from the manuscript of the authors, and original, except to the limited extent in which it is expressly stated to be a condensation from the writings of others. Brief reference is made, under the head of "Agricultural Memoranda," to the leading events of the past year—the books published, deaths recorded, chief importations of improved stock, leading public sales, &c.

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INDEX FOR No. 25, FOR 1880.

ILLUSTRATIONS.

THE

CULTIVATOR ALMANAC

FOR 1880.

ASTRONOMICAL CALCULATIONS IN EQUAL OR CLOCK TIME.

ECLIPSES FOR THE YEAR 1880.

THERE WILL BE SIX ECLIPSES this year, four of the Sun and two of the Moon.

I. A Total Eclipse of the Sun, Jan. 11; invisible in the eastern portion of the United States. The Partial and Total Phases may be visible, under unfavorable conditions, through portions of Utah, Nevada and California.

II. A Total Eclipse of the Moon, June 22; invisible in the eastern portions of the United States.

III. An Annular Eclipse of the Sun, July 7; invisible throughout North America.

IV. A Partial Eclipse of the Sun, Dec. 1; visible only in the Southern Hemisphere.

V. A Total Eclipse of the Moon, Dec. 16; invisible in the eastern portions of the United States.

VI. A Partial Eclipse of the Sun, morning of Dec. 31; visible in the eastern portion of the United States, as follows:

At Washington, D. C.: begins, 6.53; middle, 7.43; ends, 8.33. Magnitude, 4.2 digits.

At Boston, Mass.: begins, 7.19; middle, 8.16; ends, 9.13. Magnitude, 5.4 digits.

At New-York City: begins, 7.06; middle, 8.00; ends, 8.54. Magnitude, 4.9 digits.

At Albany, N. Y.: begins, 7.08; middle, 8.04; ends, 9.00. Magnitude, 5.4 digits.

At Chicago, Ill.: begins, 6.15; middle, 7.00; ends, 7.44. Magnitude, 3.9 digits.

At Cincinnati, Ohio: begins, 6.23; middle, 7.08; ends, 7.53. Magnitude, 3.5 digits.

At Charleston, S. C.: begins, 6.47; middle, 7.22; ends, 7.56. Magnitude, 1.1 digit.

CHURCH DAYS AND CYCLES OF TIME.

Septuagesima Sun.,	Jan. 25	Easter Sunday,	Mar. 28	Dominical Let.,	D & C
Sexagesima "	Feb. 1	Low "	Apl. 4	Epact,	18
Quinquagesima "	" 8	Rogation "	May 2	Golden Number,	19
Ash Wednesday,	" 11	Ascension Day,	" 6	Solar Cycle,	13
Quadragesima Sun.,	" 15	Whit Sunday,	" 16	Roman Indiction,	8
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Good Friday,	" 26	Advent Sund'y,	Nov. 28	Jewish Lunar Cycle,	16

THE FOUR SEASONS.

		H.	M.		D.	H.	M.
Winter begins,	1879, December 21,	11	18 eve., and lasts	89	0	47
Spring do.	1880, March 20,	0	5 mo., do.	92	20	19
Summer do.	1880, June 20,	8	24 eve., do.	93	14	34
Autumn do.	1880, September 22,	10	58 mo., do.	89	18	12
Winter do.	1880, December 21,	5	10 mo., Trop.year,	365	5	52

MORNING AND EVENING STARS.

MORNING STARS.—Mercury, until Feb. 14; and from March 28 to June 2; and from Aug. 5 to Sept. 17; and from Nov. 23 to the end of the year. Venus until July 13.

EVENING STARS.—Mercury from Feb. 14 to March 28; and from June 2 to Aug. 5; and from Sept. 17 to Nov. 23. Venus from July 13 to the end of the year

PLANETS BRIGHTEST.

On account of the strong twilight in which Mercury is always immersed, near sunrise or sunset, this planet will be taken to be *brightest*, or *best seen*, when farthest from the Sun, at its greatest elongation, as follows: March 10, after sunset; April 26, before sunrise; July 6, after sunset; Aug. 22, before sunrise; Nov. 4, after sunset; Dec. 13, before sunrise.

Jupiter brightest, Oct. 7. Saturn, Oct. 18.

APPARENT AND MEAN TIME.

Time is both *apparent* and *mean*. The Sun is on the meridian at 12 o'clock on four days only in the year. It is sometimes as much as 16¼ minutes before or after twelve when the shadow strikes the noon mark on the sun-dial. This is called *apparent time*. *Mean time* is determined by the *equation* of these irregularities for every day in the year, and is noted in all good almanacs. The latter is the true or correct time.

MOON'S PHASES.	D.	BOSTON. H. M.	NEW-YORK. H. M.	WASHINGT'N H. M.	SUN ON MERID. D.	H. M. S.
THIRD QUARTER	5	2 5 mo.	1 53 mo.	1 41 mo.	1	12 3 44
NEW MOON, ...	11	5 56 ev.	5 44 ev.	5 32 ev.	9	12 7 18
FIRST QUARTER,	19	1 56 mo.	1 44 mo.	1 32 mo.	17	12 10 19
FULL MOON, ...	27	5 28 mo.	5 16 mo.	5 4 mo.	25	12 12 33

DAY OF MONTH.	DAY OF WEEK.	CALENDAR For Boston, New-England, New-York State, Michigan, Wisconsin, Iowa, and Oregon. SUN RISES	SUN SETS.	MOON RISES.	H. W. BOST'N	CALENDAR For New-York City, Philadelphia, Connecticut, N. Jersey, Penn., Ohio, Indiana and Illinois. SUN RISES	SUN SETS.	MOON RISES	H. W. N. Y.	CALENDAR For Washington, Maryl'd, Virginia, Kent'ky, Miss'ri, and California. SUN RISES	SUN SETS.	MOON RISES.
		H M	H M	H M	H M	H M	H M	H M	H M	H M	H M	H M
1	T	7 30	4 38	8 58	2 3	7 25	4 44	9 0	10 49	7 19	4 49	9 2
2	F	7 30	4 39	10 5	2 43	7 25	4 44	10 5	11 29	7 19	4 50	10 6
3	S	7 30	4 40	11 13	3 25	7 25	4 45	11 12	ev. 11	7 19	4 51	11 11
4	D	7 30	4 41	morn	4 10	7 25	4 46	morn	0 56	7 19	4 51	morn
5	M	7 30	4 42	0 23	5 3	7 25	4 47	0 21	1 49	7 19	4 52	0 19
6	T	7 30	4 43	1 36	6 5	7 25	4 48	1 33	2 51	7 19	4 53	1 29
7	W	7 30	4 44	2 52	7 15	7 25	4 49	2 47	4 1	7 19	4 54	2 42
8	T	7 29	4 45	4 7	8 25	7 24	4 50	4 1	5 11	7 19	4 55	3 56
9	F	7 29	4 46	5 19	9 35	7 24	4 51	5 13	6 21	7 19	4 56	5 6
10	S	7 29	4 47	6 22	10 43	7 24	4 52	6 14	7 29	7 19	4 57	6 9
11	D	7 29	4 48	sets.	11 41	7 24	4 53	sets.	8 27	7 19	4 58	sets.
12	M	7 28	4 49	5 58	morn	7 23	4 54	6 1	9 13	7 18	4 59	6 6
13	T	7 28	4 50	7 12	0 27	7 23	4 55	7 15	9 54	7 18	5 0	7 18
14	W	7 28	4 52	8 24	1 8	7 23	4 56	8 25	10 35	7 18	5 1	8 26
15	T	7 27	4 53	9 32	1 49	7 22	4 57	9 31	11 15	7 17	5 2	9 32
16	F	7 27	4 54	10 37	2 29	7 22	4 59	10 36	11 56	7 17	5 3	10 35
17	S	7 26	4 55	11 41	3 10	7 21	5 0	11 38	morn	7 17	5 4	11 36
18	D	7 25	4 56	morn	3 51	7 21	5 1	morn	0 37	7 16	5 6	morn
19	M	7 25	4 58	0 43	4 37	7 20	5 2	0 40	1 23	7 16	5 7	0 37
20	T	7 24	4 59	1 46	5 28	7 20	5 3	1 41	2 14	7 15	5 8	1 36
21	W	7 23	5 0	2 47	6 25	7 19	5 4	2 41	3 11	7 15	5 9	2 35
22	T	7 23	5 1	3 45	7 25	7 19	5 6	3 38	4 11	7 14	5 10	3 32
23	F	7 22	5 3	4 39	8 22	7 18	5 7	4 32	5 8	7 13	5 11	4 26
24	S	7 21	5 4	5 27	9 18	7 17	5 8	5 20	6 4	7 13	5 12	5 15
25	D	7 20	5 5	6 9	10 12	7 16	5 9	6 3	6 58	7 12	5 13	5 58
26	M	7 20	5 6	6 45	11 3	7 15	5 10	6 40	7 49	7 11	5 15	6 36
27	T	7 19	5 8	rises.	11 47	7 15	5 12	rises.	8 33	7 11	5 16	rises.
28	W	7 18	5 9	6 49	ev. 24	7 14	5 13	6 51	9 10	7 10	5 17	6 53
29	T	7 17	5 10	7 57	0 59	7 13	5 14	7 57	9 45	7 9	5 18	7 58
30	F	7 16	5 11	9 5	1 36	7 12	5 15	9 4	10 22	7 8	5 19	9 4
31	S	7 15	5 13	10 14	2 16	7 11	5 17	10 12	11 2	7 7	5 20	10 11

AGRICULTURAL MEMORANDA—*October* 1, 1878, *to October* 1, 1879, *with reference to date of* THE COUNTRY GENTLEMAN *containing particulars:*

Agricultural Distress and Crop Failures in England. July 31, 1879.
Agricultural Exports of 18 years—1878 far the largest. Jan. 16, 1879.
American Berkshire Record. Vol. 3. By P. M. Springer, Springfield, Ill. March 6, 1879.
American Cotswold Record. C. P. Willard, Editor, Chicago. Vol. 1. Dec. 5, 1879.
American Devon Herd Book. Vol. 5. By H. M. Sessions, Hampden, Mass. Aug. 7, 1879.
American Devon Record. By J. Buckingham, Zanesville, Ohio. Feb. 27, 1879.

MOON'S PHASES.	D.	BOSTON. H. M.	NEW-YORK. H. M.	WASHINGT'N H. M.	SUN ON MERID. D.	H. M. S.
THIRD QUARTER	3	10 55 mo.	10 43 mo.	10 31 mo.	1	12 13 49
NEW MOON,....	10	6 33 mo.	6 21 mo.	6 9 mo.	9	12 14 27
FIRST QUARTER,	17	11 1 ev.	10 49 ev.	10 37 ev.	17	12 14 16
FULL MOON,....	25	8 38 ev.	8 26 ev.	8 14 ev.	25	12 13 18

CALENDAR

For Boston, New-England, New-York State, Michigan, Wisconsin, Iowa, and Oregon.

CALENDAR

For New-York City, Philadelphia, Connecticut, N. Jersey, Penn., Ohio, Indiana and Illinois.

CALENDAR

For Washington, Maryl'd, Virginia, Kent'ky, Miss'ri, and California.

DAY OF MONTH.	DAY OF WEEK.	SUN RISES	SUN SETS.	MOON RISES.	H. W. BOST'N	SUN RISES	SUN SETS.	MOON RISES.	H. W. N. Y.	SUN RISES	SUN SETS.	MOON RISES.
		H M	H M	H M	H M	H M	H M	H M	H M	H M	H M	H M
1	D	7 14	5 14	11 26	2 59	7 10	5 18	11 22	11 45	7 6	5 22	11 20
2	M	7 13	5 15	morn	3 47	7 9	5 19	morn	ev. 33	7 5	5 23	morn
3	T	7 12	5 17	0 40	4 42	7 8	5 20	0 35	1 28	7 5	5 24	0 31
4	W	7 10	5 18	1 53	5 49	7 7	5 21	1 48	2 35	7 4	5 25	1 43
5	T	7 9	5 19	3 4	7 5	7 6	5 23	2 59	3 51	7 3	5 26	2 52
6	F	7 8	5 21	4 8	8 17	7 5	5 24	4 2	5 3	7 2	5 27	3 56
7	S	7 7	5 22	5 2	9 25	7 4	5 25	4 57	6 11	7 0	5 28	4 51
8	D	7 6	5 23	5 47	10 28	7 3	5 26	5 43	7 14	6 59	5 30	5 38
9	M	7 5	5 25	6 23	11 21	7 1	5 28	6 20	8 7	6 58	5 31	6 17
10	T	7 3	5 26	sets.	morn	7 0	5 29	sets.	8 50	6 57	5 32	sets.
11	W	7 2	5 27	7 10	0 4	6 59	5 30	7 11	9 26	6 56	5 33	7 2
12	T	7 1	5 28	8 17	0 40	6 58	5 31	8 17	10 2	6 55	5 34	8 17
13	F	6 59	5 30	9 23	1 16	6 57	5 32	9 22	10 40	6 54	5 35	9 20
14	S	6 58	5 31	10 28	1 54	6 55	5 34	10 25	11 19	6 53	5 36	10 22
15	D	6 56	5 32	11 30	2 33	6 54	5 35	11 26	morn	6 51	5 37	11 23
16	M	6 55	5 33	morn	3 15	6 53	5 36	morn	0 1	6 50	5 39	morn
17	T	6 54	8 35	0 35	3 59	6 51	5 37	0 28	0 45	6 49	5 40	0 23
18	W	6 52	5 36	1 32	4 49	6 50	5 38	1 27	1 35	6 47	5 41	1 21
19	T	6 51	5 37	2 28	5 46	6 48	5 39	2 22	2 32	6 46	5 42	2 16
20	F	6 49	5 39	3 19	6 49	6 47	5 41	3 13	3 35	6 45	5 43	3 7
21	S	6 48	5 40	4 3	7 50	6 46	5 42	3 58	4 36	6 44	5 44	3 48
22	D	6 46	5 41	4 42	8 47	6 44	5 43	4 37	5 33	6 42	5 45	4 32
23	M	6 45	5 42	5 15	9 41	6 43	5 44	5 11	6 27	6 41	5 46	5 7
24	T	6 43	5 44	5 44	10 32	6 41	5 45	5 41	7 18	6 40	5 47	5 39
25	W	6 42	5 45	rises.	11 18	6 40	5 46	rises.	8 4	6 38	5 48	rises.
26	T	6 40	5 46	6 51	11 57	6 38	5 47	6 51	8 43	6 37	5 49	6 52
27	F	6 39	5 47	8 2	ev. 34	6 37	5 48	8 1	9 20	6 36	5 50	8 0
28	S	6 38	5 48	9 15	1 11	6 36	5 49	9 12	9 57	6 35	5 51	9 10
29	D	6 37	5 49	10 28	1 53	6 35	5 50	10 25	10 39	6 34	5 52	10 22

American Short-Horn Herd Book. Vol. 18. Buffalo; Allen & Bailey. May 8, 1879.
American Short-Horn Sales of 1878—2,043 head, averaging $151.69. April 3, 1879.
Anglo-American Cattle Company Organized in England. May 29, 1879.
Beattie, Simon, Annan, Scotland. Importation of Stock, April 3, 1879.
Bee-Keepers' Text Book. By N. H. & H. A. King. New-York: A. J. King. Nov. 14, 1878.
Biennial Report of the Kansas State Board of Agriculture. Sept. 18, 1879.
Cattle from British Columbia received at Chicago. Sept. 18, 1879.
Cental System of Dealing in Grain adopted in New-York. May 29, 1879.
Cheese Sold at Utica and Little Falls in 1878—604,153 boxes, value $3,117,936. Dec. 26, '78.

MOON'S PHASES.	D.	BOSTON. H. M.	NEW-YORK. H. M.	WASHINGT'N H. M.	SUN ON MERID. D.	H. M. S.
THIRD QUARTER	3	6 23 ev.	6 11 ev.	5 59 ev.	1	12 12 23
NEW MOON, ...	10	8 3 ev.	7 51 ev.	7 39 ev.	9	12 10 31
FIRST QUARTER,	18	7 52 ev.	7 40 ev.	7 28 ev.	17	12 8 17
FULL MOON, ...	26	8 39 mo.	8 27 mo.	8 15 mo.	25	12 5 51

CALENDAR

For Boston, New-England, New-York State, Michigan, Wisconsin, Iowa, and Oregon.

CALENDAR

For New-York City, Philadelphia, Connecticut, N. Jersey, Penn., Ohio, Indiana and Illinois.

CALENDAR

For Washington, Maryl'd, Virginia, Kent'ky, Miss'ri, and California.

DAY OF MONTH.	DAY OF WEEK.	SUN RISES	SUN SETS.	MOON RISES.	H. W. BOST'N	SUN RISES	SUN SETS.	MOON RISES	H. W. N. Y.	SUN RISES	SUN SETS.	MOON RISES.
		H M	H M	H M	H M	H M	H M	H M	H M	H M	H M	H M
1	M	6 35	5 50	11 43	2 40	6 34	5 51	11 39	11 26	6 32	5 53	11 34
2	T	6 34	5 51	morn	3 33	6 32	5 52	morn	ev. 19	6 31	5 54	morn
3	W	6 32	5 52	0 55	4 33	6 31	5 53	0 55	1 19	6 29	5 55	0 44
4	T	6 30	5 53	2 1	5 44	6 29	5 55	1 55	2 30	6 28	5 56	1 49
5	F	6 29	5 55	2 57	6 59	6 28	5 56	2 52	3 45	6 26	5 57	2 46
6	S	6 27	5 56	3 44	8 7	6 26	5 57	3 39	4 53	6 25	5 58	3 34
7	C	6 25	5 57	4 22	9 9	6 25	5 58	4 19	5 55	6 24	5 59	4 14
8	M	6 24	5 58	4 53	10 4	6 23	5 59	4 51	6 50	6 22	6 0	4 49
9	T	6 22	5 59	5 22	10 53	6 21	6 0	5 20	7 39	6 20	6 1	5 19
10	W	6 20	6 1	sets.	11 36	6 20	6 1	sets.	8 22	6 19	6 2	sets.
11	T	6 19	6 2	7 6	morn	6 18	6 2	7 5	8 58	6 17	6 3	7 4
12	F	6 17	6 3	8 11	0 12	6 16	6 3	8 9	9 31	6 16	6 4	8 7
13	S	6 15	6 4	9 15	0 44	6 15	6 5	9 12	10 7	6 15	6 5	9 9
14	C	6 14	6 5	10 18	1 21	6 13	6 6	10 14	10 47	6 13	6 6	10 10
15	M	6 12	6 6	11 21	2 1	6 11	6 7	11 14	11 29	6 11	6 7	11 9
16	T	6 10	6 7	morn	2 43	6 10	6 8	morn	morn	6 10	6 8	morn
17	W	6 8	6 9	0 17	3 27	6 8	6 9	0 11	0 13	6 8	6 9	0 5
18	T	6 7	6 10	1 9	4 17	6 6	6 10	1 3	1 3	6 6	6 10	0 58
19	F	6 5	6 11	1 56	5 13	6 5	6 11	1 50	1 59	6 5	6 11	1 45
20	S	6 3	6 12	2 37	6 14	6 3	6 12	2 32	3 0	6 3	6 12	2 27
21	C	6 1	6 13	3 12	7 15	6 1	6 13	3 7	4 1	6 2	6 13	3 3
22	M	6 0	6 14	3 42	8 10	6 0	6 14	3 39	4 56	6 0	6 14	3 36
23	T	5 58	6 15	4 10	9 3	5 58	6 15	4 8	5 49	5 59	6 15	3 59
24	W	5 56	6 17	4 36	9 54	5 57	6 16	4 35	6 40	5 57	6 16	4 34
25	T	5 54	6 18	5 1	10 43	5 55	6 17	5 2	7 29	5 55	6 17	5 2
26	F	5 53	6 19	rises.	11 29	5 53	6 18	rises.	8 15	5 54	6 18	rises.
27	S	5 51	6 20	8 11	ev. 11	5 52	6 19	8 8	8 57	5 52	6 19	8 5
28	C	5 49	6 21	9 28	0 50	5 50	6 20	9 24	9 36	5 51	6 20	9 19
29	M	5 47	6 22	10 43	1 38	5 48	6 21	10 38	10 24	5 49	6 21	10 32
30	T	5 46	6 23	11 52	2 30	5 47	6 22	11 46	11 16	5 48	6 22	11 41
31	W	5 44	6 25	morn	3 27	5 45	6 24	morn	ev. 13	5 46	6 23	morn

Clay, Brutus J., Bourbon Co., Ky. Obituary. Oct. 24, 1878.
Commission to Investigate Causes of Agricultural Distress in England. Aug. 28, 1879.
Dairy Show at New-York City. Dec. 12 and 19, 1878.
Darlington, H. T., Doylestown, Pa. Obituary. Dec. 5, 1878.
Diseases of Live Stock. By Dr. L. V. Tellor. Philadelphia: H. C. Watts & Co. April 3, 1879.
Department of Agriculture, Washington, D. C. Report for 1877. Nov. 14, 1878.
English Short-Horn Sales of 1878—2,811 head, averaging £57 5s. 9d. Dec. 12, 1878.

MOON'S PHASES.	D.	BOSTON. H. M.	NEW-YORK. H. M.	WASHINGT'N H. M.	SUN ON MERID. D.	H. M. S.
THIRD QUARTER	2	1 29 mo.	1 17 mo.	1 5 mo.	1	12 3 43
NEW MOON, ...	9	10 23 mo.	10 11 mo.	9 59 mo.	9	12 1 24
FIRST QUARTER,	17	2 30 ev.	2 18 ev.	2 6 ev	17	11 59 23
FULL MOON, ...	24	6 6 ev.	5 54 ev.	5 42 ev.	25	11 57 46

CALENDAR

For Boston, New-England, New-York State, Michigan, Wisconsin, Iowa, and Oregon.

CALENDAR

For New-York City, Philadelphia, Connecticut, N. Jersey, Penn., Ohio, Indiana and Illinois.

CALENDAR

For Washington, Maryl'd, Virginia, Kent'ky, Miss'ri, and California.

DAY OF MONTH.	DAY OF WEEK.	SUN RISES	SUN SETS.	MOON RISES.	H. W. BOST'N	SUN RISES	SUN SETS.	MOON RISES.	H. W. N. Y.	SUN RISES	SUN SETS.	MOON RISES.
		H M	H M	H M	H M	H M	H M	H M	H M	H M	H M	H M
1	T	5 42	6 26	0 53	4 29	5 43	6 25	0 47	1 15	5 44	6 23	0 41
2	F	5 41	6 27	1 42	5 37	5 42	6 26	1 37	2 23	5 43	6 24	1 32
3	S	5 39	6 28	2 24	6 45	5 40	6 27	2 19	3 31	5 41	6 25	2 14
4	☾	5 37	6 29	2 56	7 47	5 38	6 28	2 53	4 33	5 40	6 26	2 49
5	M	5 35	6 30	3 25	8 42	5 37	6 29	3 23	5 28	5 38	6 27	3 21
6	T	5 34	6 31	3 50	9 32	5 35	6 30	3 49	6 18	5 37	6 28	3 49
7	W	5 32	6 32	4 14	10 20	5 34	6 31	4 14	7 6	5 35	6 29	4 16
8	T	5 30	6 33	4 38	11 4	5 32	6 32	4 39	7 50	5 34	6 30	4 41
9	F	5 29	6 35	sets.	11 43	5 30	6 33	sets.	8 29	5 32	6 31	sets.
10	S	5 27	6 36	8 5	morn	5 29	6 34	8 2	9 16	5 31	6 32	7 58
11	☾	5 25	6 37	9 8	0 30	5 27	6 35	9 3	9 40	5 29	6 33	8 58
12	M	5 24	6 38	10 6	0 54	5 26	6 36	10 1	10 21	5 28	6 34	9 55
13	T	5 22	6 39	11 1	1 35	5 24	6 37	10 55	11 3	5 26	6 35	10 49
14	W	5 20	6 40	11 49	2 17	5 22	6 38	11 44	11 48	5 25	6 36	11 38
15	T	5 19	6 41	morn	3 2	5 21	6 39	morn	morn	5 23	6 37	morn
16	F	5 17	6 42	0 32	3 49	5 19	6 40	0 27	0 35	5 22	6 38	0 21
17	S	5 16	6 44	1 9	4 40	5 18	6 41	1 4	1 26	5 20	6 39	1 0
18	☾	5 14	6 45	1 40	5 35	5 16	6 42	1 37	2 21	5 19	6 40	1 33
19	M	5 12	6 46	2 9	6 33	5 15	6 43	2 6	3 19	5 18	6 41	2 4
20	T	5 11	6 47	2 35	7 28	5 13	6 44	2 34	4 14	5 16	6 42	2 32
21	W	5 9	6 48	3 0	8 21	5 12	6 45	3 0	5 7	5 15	6 42	3 0
22	T	5 8	6 49	3 25	9 13	5 11	6 46	3 27	5 59	5 13	6 43	3 28
23	F	5 6	6 50	3 53	10 7	5 9	6 47	3 55	6 53	5 12	6 44	3 58
24	S	5 5	6 51	rises.	11 0	5 8	6 48	rises.	7 46	5 11	6 45	rises.
25	☾	5 3	6 52	8 21	11 51	5 6	6 49	8 16	8 37	5 9	6 46	8 11
26	M	5 2	6 54	9 35	ev. 38	5 5	6 51	9 30	9 24	5 7	6 47	9 24
27	T	5 0	6 55	10 42	1 27	5 4	6 52	10 36	10 13	5 6	6 48	10 30
28	W	4 59	6 56	11 37	2 23	5 2	6 53	11 32	11 9	5 5	6 49	11 26
29	T	4 58	6 57	morn	3 20	5 1	6 54	morn	ev. 6	5 4	6 50	morn
30	F	4 56	6 58	0 22	4 17	5 0	6 55	0 18	1 3	5 3	6 51	0 14

Ensilage of Corn Fodder. By J. B. Brown, from French of A. Goffart. Feb. 6, 1879.
Evans, H., Frankfort, Ky., Editor American Short-Horn Record. Obituary. July 3, 1879.
Experiment Station Organized at Cornell University. April 10, 1879.
Fat Stock Show at Chicago. Dec. 12, 1878.
Fitch, Dr. Asa, Salem, N. Y. Late State Entomologist. Obituary, April 24, 1879.
Four States (Ohio, Illinois, Iowa and Kansas) return 9,412,587 Swine, in 1879. Aug. 28, '79.
French Wheat Crop of 1879, estimated at 225,000,000 bushels. Sept. 11, 1879.
Hand Book of Virginia. By Dr. Thos. Pollard, State Commissioner of Agriculture. March 27, 1879.

MOON'S PHASES.	D.	BOSTON. H. M.	NEW-YORK. H. M.	WASHINGT'N H. M.	SUN ON MERID. D.	H. M. S.
THIRD QUARTER	1	9 9 mo.	8 57 mo.	8 45 mo.	1	11 56 54
NEW MOON, ...	9	1 32 mo.	1 20 mo.	1 8 mo.	9	11 56 15
FIRST QUARTER,	17	5 39 mo.	5 27 mo.	5 15 mo.	17	11 56 13
FULL MOON, ...	24	1 55 mo.	1 43 mo.	1 31 mo.	25	11 56 46
THIRD QUARTER	30	6 9 ev.	5 57 ev.	5 45 ev.	31	11 57 31

CALENDAR

For Boston, New-England, New-York State, Michigan, Wisconsin, Iowa, and Oregon.

CALENDAR

For New-York City, Philadelphia, Connecticut, N. Jersey, Penn., Ohio, Indiana and Illinois.

CALENDAR

For Washington, Maryl'd, Virginia, Kent'ky, Miss'i, and California.

DAY OF MONTH.	DAY OF WEEK.	SUN RISES	SUN SETS.	MOON RISES.	H. W. BOST'N	SUN RISES	SUN SETS.	MOON RISES	H. W. N. Y.	SUN RISES	SUN SETS.	MOON RISES.
		H M	H M	H M	H M	H M	H M	H M	H M	H M	H M	H M
1	S	4 55	6 59	0 58	5 16	4 58	6 56	0 55	2 2	5 2	6 52	0 51
2	☾	4 53	7 0	1 17	6 17	4 57	6 57	1 26	3 3	5 1	6 53	1 24
3	M	4 52	7 1	1 54	7 15	4 56	6 58	1 53	4 1	4 59	6 54	1 52
4	T	4 51	7 3	2 18	8 5	4 54	6 59	2 19	4 51	4 58	6 55	2 19
5	W	4 49	7 4	2 42	8 55	4 53	7 0	2 43	5 41	4 57	6 56	2 47
6	T	4 48	7 5	3 6	9 44	4 52	7 1	3 9	6 30	4 56	6 57	3 11
7	F	4 47	7 6	3 32	10 30	4 51	7 2	3 36	7 16	4 55	6 58	3 39
8	S	4 46	7 7	4 1	11 15	4 50	7 3	4 5	8 1	4 54	6 59	4 10
9	☾	4 45	7 8	sets.	11 57	4 49	7 4	sets.	8 43	4 53	7 0	sets.
10	M	4 43	7 9	8 54	morn	4 48	7 5	8 48	9 21	4 52	7 1	8 43
11	T	4 42	7 10	9 45	0 35	4 47	7 6	9 39	9 58	4 51	7 2	9 33
12	W	4 41	7 11	10 29	1 12	4 46	7 7	10 24	10 40	4 50	7 3	10 18
13	T	4 40	7 12	11 7	1 54	4 44	7 8	11 3	11 24	4 49	7 3	10 58
14	F	4 39	7 13	11 40	2 38	4 43	7 9	11 36	morn	4 48	7 4	11 32
15	S	4 38	7 14	morn	3 21	4 42	7 10	morn	0 7	4 47	7 5	morn
16	☾	4 37	7 15	0 9	4 6	4 42	7 11	0 6	0 52	4 46	7 6	0 3
17	M	4 36	7 16	0 35	4 53	4 41	7 12	0 34	1 39	4 45	7 7	0 32
18	T	4 35	7 17	1 1	5 47	4 40	7 13	0 59	2 33	4 44	7 8	1 59
19	W	4 34	7 18	1 25	6 44	4 39	7 14	1 25	3 30	4 44	7 9	1 27
20	T	4 33	7 19	1 50	7 40	4 38	7 15	1 56	4 26	4 43	7 10	1 54
21	F	4 33	7 20	2 20	8 36	4 37	7 16	2 23	5 22	4 42	7 11	2 26
22	S	4 32	7 21	2 53	9 36	4 37	7 16	2 57	6 22	4 42	7 11	3 2
23	☾	4 31	7 22	3 35	10 37	4 36	7 17	3 40	7 23	4 41	7 12	3 46
24	M	4 30	7 23	rises.	11 37	4 35	7 18	rises.	8 23	4 40	7 13	rises.
25	T	4 29	7 24	9 24	ev. 29	4 34	7 19	9 19	9 15	4 40	7 14	9 13
26	W	4 28	7 25	10 15	1 19	4 34	7 20	10 10	10 5	4 39	7 15	10 5
27	T	4 28	7 26	10 56	2 13	4 33	7 21	10 52	10 59	4 38	7 15	10 48
28	F	4 27	7 27	11 29	3 4	4 33	7 21	11 27	11 50	4 38	7 16	11 24
29	S	4 27	7 27	11 57	3 55	4 32	7 22	11 56	ev. 41	4 37	7 17	11 55
30	☾	4 26	7 28	morn	4 44	4 32	7 23	morn	1 31	4 37	7 18	morn
31	M	4 26	7 29	0 22	5 39	4 31	7 24	0 22	2 25	4 37	7 18	0 23

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MOON'S PHASES.	D.	BOSTON. H. M.	NEW-YORK. H. M.	WASHINGT'N H. M.	SUN ON MERID. D.	H. M. S.
NEW MOON,....	7	5 11 ev.	4 59 ev.	4 47 ev.	1	11 57 40
FIRST QUARTER,	15	5 7 ev.	4 55 ev.	4 43 ev.	9	11 59 6
FULL MOON,....	22	9 2 mo.	8 50 mo.	8 38 mo.	17	12 0 46
THIRD QUARTER	29	5 13 mo.	5 1 mo.	4 49 mo.	25	12 2 28

CALENDAR

For Boston, New-England, New-York State, Michigan, Wisconsin, Iowa, and Oregon.

CALENDAR

For New-York City, Philadelphia, Connecticut, N. Jersey, Penn., Ohio, Indiana and Illinois.

CALENDAR

For Washington, Maryl'd, Virginia, Kent'ky, Miss'ri, and California.

DAY OF MONTH.	DAY OF WEEK.	SUN RISES	SUN SETS.	MOON RISES.	H. W. BOST'N	SUN RISES	SUN SETS.	MOON RISES.	H. W. N. Y.	SUN RISES	SUN SETS.	MOON RISES.
		H M	H M	H M	H M	H M	H M	H M	H M	H M	H M	H M
1	T	4 25	7 30	0 47	6 34	4 31	7 25	0 47	3 20	4 36	7 19	0 49
2	W	4 25	7 31	1 11	7 28	4 30	7 25	1 13	4 14	4 36	7 20	1 15
3	T	4 24	7 31	1 36	8 18	4 30	7 26	1 39	5 4	4 35	7 20	1 42
4	F	4 24	7 32	2 4	9 9	4 30	7 27	2 8	5 55	4 35	7 21	2 12
5	S	4 24	7 33	2 35	10 0	4 29	7 27	2 40	6 46	4 35	7 22	2 46
6	☾	4 23	7 34	3 12	10 49	4 29	7 28	3 18	7 35	4 35	7 22	3 24
7	M	4 23	7 34	sets.	11 36	4 29	7 29	sets.	8 22	4 34	7 23	sets.
8	T	4 23	7 35	8 27	morn	4 28	7 29	8 22	9 2	4 34	7 23	8 16
9	W	4 23	7 35	9 8	0 16	4 28	7 30	9 3	9 38	4 34	7 24	8 57
10	T	4 23	7 36	9 42	0 52	4 28	7 30	9 38	10 17	4 34	7 25	9 34
11	F	4 22	7 37	10 12	1 31	4 28	7 31	10 9	10 57	4 34	7 25	10 6
12	S	4 22	7 37	10 39	2 11	4 28	7 31	10 37	11 37	4 34	7 25	10 34
13	☾	4 22	7 38	11 3	2 51	4 28	7 31	11 2	morn	4 34	7 26	11 1
14	M	4 22	7 38	11 27	3 32	4 28	7 32	11 27	0 18	4 34	7 26	11 27
15	T	4 22	7 38	11 51	4 16	4 28	7 33	11 53	1 2	4 34	7 27	11 53
16	W	4 22	7 39	morn	5 5	4 28	7 33	morn	1 51	4 34	7 27	morn
17	T	4 22	7 39	0 18	6 1	4 28	7 33	0 20	2 47	4 34	7 27	0 24
18	F	4 22	7 39	0 48	7 4	4 28	7 34	0 52	3 50	4 34	7 28	0 56
19	S	4 23	7 40	1 24	8 8	4 28	7 34	1 29	4 54	4 34	7 28	1 34
20	☾	4 23	7 40	2 9	9 14	4 28	7 34	2 15	6 0	4 34	7 28	2 21
21	M	4 23	7 40	3 5	10 23	4 29	7 35	3 11	7 9	4 35	7 29	3 18
22	T	4 23	7 40	rises.	11 27	4 29	7 35	rises.	8 13	4 35	7 29	rises.
23	W	4 23	7 41	8 46	ev. 20	4 29	7 35	8 44	9 6	4 35	7 29	8 40
24	T	4 23	7 41	9 26	1 6	4 29	7 35	9 23	9 52	4 35	7 29	9 20
25	F	4 24	7 41	9 57	1 53	4 30	7 35	9 55	10 39	4 36	7 29	9 54
26	S	4 24	7 41	10 25	2 39	4 30	7 35	10 24	11 25	4 36	7 29	10 23
27	☾	4 24	7 41	10 50	3 24	4 31	7 35	10 50	ev. 10	4 36	7 29	10 51
28	M	4 25	7 41	11 14	4 9	4 31	7 35	11 16	0 55	4 37	7 29	11 18
29	T	4 25	7 41	11 39	5 2	4 31	7 35	11 42	1 48	4 37	7 29	11 45
30	W	4 26	7 41	morn	5 50	4 32	7 35	morn	2 36	4 38	7 29	morn

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MOON'S PHASES.	D.	BOSTON. H. M.	NEW-YORK. H. M.	WASHINGT'N H. M.	SUN ON MERID. D.	H. M. S.
NEW MOON, ...	7	8 37 mo.	8 25 mo.	8 13 mo.	1	12 3 41
FIRST QUARTER,	15	1 32 mo.	1 20 mo.	1 8 mo.	9	12 5 2
FULL MOON, ...	21	4 18 ev.	4 6 ev.	3 54 ev.	17	12 5 56
THIRD QUARTER	28	6 57 ev.	6 45 ev.	6 33 ev.	25	12 6 15

CALENDAR For Boston, New-England, New-York State, Michigan, Wisconsin, Iowa, and Oregon.

CALENDAR For New-York City, Philadelphia, Connecticut, N. Jersey, Penn., Ohio, Indiana and Illinois.

CALENDAR For Washington, Maryl'd, Virginia, Kent'ky, Miss'ri, and California.

DAY OF MONTH.	DAY OF WEEK.	SUN RISES	SUN SETS.	MOON RISES.	H. W. BOST'N	SUN RISES	SUN SETS.	MOON RISES	H. W. N. Y.	SUN RISES	SUN SETS.	MOON RISES.
		H M	H M	H M	H M	H M	H M	H M	H M	H M	H M	H M
1	T	4 27	7 41	0 6	6 48	4 32	7 35	0 11	3 34	4 38	7 29	0 15
2	F	4 27	7 41	0 37	7 43	4 33	7 35	0 42	4 29	4 39	7 29	0 47
3	S	4 28	7 40	1 12	8 37	4 33	7 35	1 18	5 23	4 39	7 29	1 24
4	☾	4 28	7 40	1 53	9 32	4 34	7 34	1 59	6 18	4 40	7 29	2 5
5	M	4 29	7 40	2 40	10 25	4 35	7 34	2 46	7 11	4 40	7 28	2 53
6	T	4 30	7 40	3 33	11 13	4 35	7 34	3 39	7 59	4 41	7 28	3 45
7	W	4 30	7 39	sets.	11 56	4 36	7 34	sets.	8 42	4 41	7 28	sets.
8	T	4 31	7 39	8 16	morn	4 36	7 33	8 12	9 18	4 42	7 28	8 9
9	F	4 32	7 38	8 43	0 32	4 37	7 33	8 41	9 52	4 43	7 27	8 38
10	S	4 32	7 38	9 9	1 6	4 38	7 33	9 7	10 29	4 43	7 27	9 6
11	☾	4 33	7 37	9 32	1 43	4 38	7 32	9 32	11 7	4 44	7 27	9 32
12	M	4 34	7 37	9 56	2 21	4 39	7 32	9 57	11 47	4 45	7 26	9 58
13	T	4 35	7 36	10 21	3 1	4 40	7 31	10 23	morn	4 45	7 26	10 25
14	W	4 35	7 36	10 48	3 44	4 41	7 31	10 52	0 30	4 46	7 25	10 55
15	T	4 36	7 35	11 21	4 32	4 41	7 30	11 25	1 18	4 47	7 25	11 30
16	F	4 37	7 35	morn	5 31	4 42	7 29	morn	2 17	4 48	7 24	morn
17	S	4 38	7 34	0 1	6 39	4 43	7 29	0 6	3 25	4 48	7 24	0 12
18	☾	4 39	7 33	0 49	7 51	4 44	7 28	0 56	4 37	4 49	7 23	1 3
19	M	4 40	7 32	1 49	9 2	4 45	7 27	1 56	5 48	4 50	7 22	2 3
20	T	4 41	7 32	3 0	10 13	4 46	7 27	3 6	6 59	4 51	7 22	3 13
21	W	4 42	7 31	rises.	11 14	4 46	7 26	rises.	8 1	4 51	7 21	rises.
22	T	4 43	7 30	7 54	ev. 5	4 47	7 25	7 52	8 51	4 52	7 20	7 49
23	F	4 43	7 29	8 24	0 46	4 48	7 24	8 23	9 32	4 53	7 19	8 22
24	S	4 44	7 28	8 51	1 28	4 49	7 24	8 51	10 14	4 54	7 19	8 51
25	☾	4 45	7 27	9 16	2 9	4 50	7 23	9 17	10 55	4 55	7 18	9 19
26	M	4 46	7 26	9 41	2 50	4 51	7 22	9 44	11 36	4 56	7 17	9 46
27	T	4 47	7 25	10 8	3 33	4 52	7 21	10 12	ev. 19	4 56	7 16	10 16
28	W	4 48	7 24	10 38	4 19	4 53	7 20	10 43	1 5	4 57	7 15	10 47
29	T	4 49	7 23	11 12	5 10	4 54	7 19	11 17	1 56	4 58	7 14	11 23
30	F	4 50	7 22	11 50	6 9	4 55	7 18	11 56	2 55	4 59	7 13	morn
31	S	4 51	7 21	morn	7 10	4 56	7 17	morn	3 56	5 0	7 12	0 3

Jersey Cattle imported by E. P. P. Fowler. Dec. 5, 1878; Jan. 23; April 24, 1879. By P. H. Fowler. Nov. 21, 1878; Feb. 20, 1879.

Kansas Wheat Crop over 32,000,000 bushels; Corn estimated at 125,000,000 bushels. Aug. 21, 1879.

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MOON'S PHASES.	D.	H. M.	H. M.	H. M.	D.	H. M. S.
		BOSTON.	NEW-YORK.	WASHINGT'N	SUN ON MERID.	
NEW MOON,....	5	11 4 ev.	10 52 ev.	10 40 ev.	1	12 6 2
FIRST QUARTER,	13	6 58 mo.	6 46 mo.	6 34 mo.	9	12 5 11
FULL MOON,....	20	0 34 mo.	0 22 mo.	0 10 mo.	17	12 3 44
THIRD QUARTER	27	11 31 mo.	11 19 mo.	11 7 ev.	25	12 1 44

DAY OF MONTH.	DAY OF WEEK.	CALENDAR For Boston, New-England, New-York State, Michigan, Wisconsin, Iowa, and Oregon.				CALENDAR For New-York City, Philadelphia, Connecticut, N. Jersey, Penn., Ohio, Indiana and Illinois.				CALENDAR For Washington, Maryl'd, Virginia, Kent'ky, Miss'ri, and California.			
		SUN RISES.	SUN SETS.	MOON RISES.	H. W. BOST'N	SUN RISES	SUN SETS.	MOON RISES.	H. W. N. Y.	SUN RISES	SUN SETS.	MOON RISES.	
		H M	H M	H M	H M	H M	H M	H M	H M	H M	H M	H M	
1	☾	4 52	7 20	0 35	8 8	4 56	7 16	0 41	4 54	5 1	7 11	0 48	
2	M	4 53	7 19	1 26	9 3	4 57	7 15	1 32	5 49	5 2	7 10	1 39	
3	T	4 54	7 18	2 22	9 57	4 58	7 14	2 28	6 43	5 3	7 9	2 34	
4	W	4 55	7 16	3 22	10 46	4 59	7 12	3 27	7 32	5 4	7 8	3 33	
5	T	4 57	7 15	sets.	11 30	5 0	7 11	sets.	8 16	5 4	7 7	sets.	
6	F	4 58	7 14	7 13	morn	5 1	7 10	7 11	8 54	5 5	7 6	7 10	
7	S	4 59	7 13	7 38	0 8	5 2	7 9	7 37	9 27	5 6	7 5	7 36	
8	☾	5 0	7 11	8 2	0 41	5 3	7 8	8 2	10 2	5 7	7 4	8 3	
9	M	5 1	7 10	8 26	1 16	5 4	7 6	8 28	10 39	5 8	7 3	8 30	
10	T	5 2	7 9	8 53	1 53	5 5	7 5	8 56	11 20	5 9	7 2	8 59	
11	W	5 3	7 7	9 23	2 34	5 6	7 4	9 27	morn	5 10	7 1	9 32	
12	T	5 4	7 6	9 59	3 20	5 7	7 2	10 5	0 6	5 11	7 0	10 10	
13	F	5 5	7 4	10 43	4 11	5 8	7 1	10 50	0 57	5 12	6 58	10 56	
14	S	5 6	7 3	11 37	5 14	5 9	7 0	11 44	2 0	5 13	6 56	11 51	
15	☾	5 7	7 2	morn	6 27	5 10	6 58	morn	3 13	5 14	6 55	morn	
16	M	5 8	7 0	0 41	7 43	5 11	6 57	0 48	4 29	5 14	6 54	0 54	
17	T	5 9	6 59	1 53	8 53	5 12	6 56	1 59	5 39	5 15	6 52	2 5	
18	W	5 10	6 57	3 9	9 58	5 13	6 54	3 14	6 44	5 16	6 51	3 19	
19	T	5 11	6 56	4 26	10 55	5 14	6 53	4 29	7 41	5 17	6 50	4 33	
20	F	5 12	6 54	rises.	11 43	5 15	6 52	rises.	8 29	5 18	6 49	rises.	
21	S	5 13	6 52	7 16	ev. 23	5 16	6 50	7 17	9 9	5 19	6 47	7 18	
22	☾	5 15	6 51	7 42	0 58	5 17	6 48	7 44	9 44	5 20	6 46	7 46	
23	M	5 16	6 49	8 9	1 37	5 18	6 47	8 12	10 23	5 21	6 44	8 15	
24	T	5 17	6 48	8 38	2 18	5 19	6 45	8 42	11 4	5 22	6 43	8 46	
25	W	5 18	6 46	9 10	2 58	5 20	6 44	9 16	11 44	5 23	6 41	9 21	
26	T	5 19	6 45	9 48	3 46	5 21	6 42	9 54	ev. 32	5 23	6 40	10 0	
27	F	5 20	6 43	10 30	4 36	5 22	6 41	10 37	1 22	5 24	6 38	10 43	
28	S	5 21	6 41	11 19	5 34	5 23	6 39	11 25	2 20	5 25	6 37	11 32	
29	☾	5 22	6 40	morn	6 36	5 24	6 38	morn	3 22	5 26	6 35	morn	
30	M	5 23	6 38	0 13	7 36	5 25	6 36	0 19	4 22	5 27	6 34	0 25	
31	T	5 24	6 36	1 7	8 31	5 26	6 34	1 13	5 17	5 28	6 32	1 23	

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Mules Exported from the United States for Army Use in Southern Africa. June 19, '79.
New-Jersey State Agricultural Report for 1878. April 10, 1879.
New-York State Agricultural Society. Horatio Seymour chosen President. Jan. 30, '79.
New-York State Sheep Show at Canandaigua. May 1, 1879.

MOON'S PHASES.	D.	BOSTON. H. M.	NEW-YORK. H. M.	WASHINGT'N H. M.	SUN ON MERID. D.	H. M. S.
NEW MOON,....	4	0 8 ev.	11 56 mo.	11 44 mo.	1	11 59 38
FIRST QUARTER,	11	1 41 ev.	1 29 ev.	1 17 ev.	9	11 56 59
FULL MOON,....	18	10 45 mo.	10 33 mo.	10 21 mo.	17	11 54 11
THIRD QUARTER	26	6 24 mo.	6 12 mo.	6 0 mo.	25	11 51 23

CALENDAR

For Boston, New-England, New-York State, Michigan, Wisconsin, Iowa, and Oregon.

DAY OF MONTH.	DAY OF WEEK.	SUN RISES	SUN SETS.	MOON RISES.	H. W. BOST'N
		H M	H M	H M	H M
1	W	5 25	6 35	2 13	9 23
2	T	5 26	6 33	3 16	10 12
3	F	5 27	6 31	4 20	10 58
4	S	5 28	6 30	sets.	11 38
5	☾	5 29	6 28	6 32	morn
6	M	5 30	6 26	6 57	0 16
7	T	5 31	6 24	7 27	0 50
8	W	5 33	6 23	8 2	1 30
9	T	5 34	6 21	8 43	2 16
10	F	5 35	6 19	9 33	3 8
11	S	5 36	6 17	10 35	4 2
12	☾	5 37	6 16	11 41	5 8
13	M	5 38	6 14	morn	6 21
14	T	5 39	6 12	0 53	7 33
15	W	5 40	6 10	2 7	8 36
16	T	5 41	6 8	3 21	9 35
17	F	5 42	6 7	4 33	10 28
18	S	5 43	6 5	rises.	11 15
19	☾	5 44	6 3	6 9	11 56
20	M	5 45	6 1	6 38	ev. 32
21	T	5 46	6 0	7 9	1 8
22	W	5 47	5 58	7 45	1 49
23	T	5 49	5 56	8 24	2 32
24	F	5 50	5 54	9 12	3 18
25	S	5 51	5 53	10 4	4 7
26	☾	5 52	5 51	11 0	5 0
27	M	5 53	5 49	morn	5 57
28	T	5 54	5 47	0 1	6 57
29	W	5 55	5 45	1 2	7 51
30	T	5 56	5 44	2 5	8 42

CALENDAR

For New-York City, Philadelphia, Connecticut, N. Jersey, Penn., Ohio, Indiana and Illinois.

SUN RISES	SUN SETS.	MOON RISES.	H. W. N. Y.
H M	H M	H M	H M
5 27	6 33	2 18	6 9
5 28	6 31	3 20	6 58
5 29	6 30	4 23	7 44
5 30	6 28	sets.	8 24
5 31	6 26	6 33	9 2
5 32	6 25	7 0	9 36
5 33	6 23	7 31	10 16
5 34	6 21	8 6	11 2
5 35	6 20	8 54	11 52
5 36	6 18	9 40	morn
5 37	6 16	10 39	0 48
5 38	6 15	11 47	1 54
5 39	6 13	morn	3 7
5 40	6 11	0 58	4 19
5 41	6 10	2 11	5 22
5 42	6 8	3 23	6 21
5 43	6 6	4 34	7 14
5 44	6 4	rises.	8 1
5 45	6 3	6 12	8 42
5 46	6 1	6 41	9 18
5 47	5 59	7 14	9 54
5 48	5 58	7 50	10 35
5 49	5 56	8 32	11 18
5 50	5 54	9 2	ev. 4
5 51	5 53	10 10	0 53
5 52	5 51	11 6	1 46
5 53	5 49	morn	2 43
5 54	5 48	0 5	3 43
5 55	5 46	1 6	4 37
5 56	5 44	2 8	5 28

CALENDAR

For Washington, Maryl'd, Virginia, Kent'ky, Miss'ri, and California.

SUN RISES	SUN SETS.	MOON RISES.
H M	H M	H M
5 29	6 31	2 22
5 30	6 29	3 24
5 31	6 28	4 25
5 32	6 26	sets.
5 33	6 25	6 34
5 33	6 23	7 3
5 34	6 22	7 35
5 35	6 20	8 11
5 36	6 18	8 55
5 37	6 17	9 46
5 38	6 15	10 46
5 39	6 14	11 53
5 40	6 12	morn
5 41	6 11	1 3
5 41	6 9	2 15
5 42	6 7	3 26
5 43	6 6	4 35
5 44	6 4	rises.
5 45	6 2	6 14
5 46	6 1	6 45
5 47	5 58	7 18
5 48	5 57	7 56
5 49	5 56	8 38
5 50	5 54	9 25
5 51	5 53	10 16
5 51	5 52	11 12
5 52	5 50	morn
5 53	5 49	0 10
5 54	5 48	1 10
5 55	5 46	2 11

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Ohio Short-Horn Record. By L. D. Hagerty, Columbus, Ohio. Oct. 24, 1878
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MOON'S PHASES.	D.	BOSTON. H. M.	NEW-YORK. H. M.	WASHINGT'N H. M.	SUN ON MERID. D.	H. M. S.
NEW MOON, ...	3	11 59 ev.	11 47 ev.	11 35 ev.	1	11 49 25
FIRST QUARTER,	10	7 51 ev.	7 39 ev.	7 27 ev.	9	11 47 6
FULL MOON, ...	17	11 42 ev.	11 30 ev.	11 18 ev.	17	11 45 16
THIRD QUARTER	26	2 15 mo.	2 3 mo.	1 52 mo.	25	11 44 4

CALENDAR

For Boston, New-England, New-York State, Michigan, Wisconsin, Iowa, and Oregon.

CALENDAR

For New-York City, Philadelphia, Connecticut, N. Jersey, Penn., Ohio, Indiana and Illinois.

CALENDAR

For Washington, Maryl'd, Virginia, Kent'ky, Miss'ri, and California.

DAY OF MONTH.	DAY OF WEEK.	SUN RISES	SUN SETS.	MOON RISES.	H. W. BOST'N	SUN RISES	SUN SETS.	MOON RISES	H. W. N. Y.	SUN RISES	SUN SETS.	MOON RISES.
		H M	H M	H M	H M	H M	H M	H M	H M	H M	H M	H M
1	F	5 57	5 42	3 10	9 32	5 57	5 43	3 11	6 18	5 56	5 43	3 13
2	S	5 58	5 40	4 16	10 20	5 58	5 41	4 16	7 6	5 57	5 42	4 17
3	C	6 0	5 39	sets.	11 7	6 0	5 39	sets.	7 53	5 58	5 40	sets.
4	M	6 1	5 37	5 28	11 51	6 1	5 38	5 31	8 37	5 59	5 39	5 35
5	T	6 2	5 35	6 2	morn	6 2	5 36	6 6	9 17	6 0	5 37	6 11
6	W	6 3	5 33	6 42	0 31	6 3	5 34	6 47	10 0	6 1	5 35	6 53
7	T	6 4	5 32	7 30	1 14	6 4	5 33	7 37	10 50	6 2	5 34	7 43
8	F	6 5	5 30	8 28	2 4	6 5	5 31	8 35	11 45	6 3	5 33	8 41
9	S	6 6	5 28	9 34	2 59	6 6	5 30	9 40	morn	6 4	5 31	9 46
10	C	6 7	5 27	10 45	3 58	6 7	5 28	10 50	0 44	6 5	5 29	10 55
11	M	6 8	5 25	11 57	5 0	6 8	5 26	morn	1 46	6 6	5 28	morn
12	T	6 10	5 24	morn	6 8	6 9	5 25	0 1	2 54	6 7	5 26	0 6
13	W	6 11	5 22	1 9	7 13	6 10	5 23	1 12	3 59	6 8	5 25	1 15
14	T	6 12	5 20	2 20	8 10	6 11	5 22	2 21	4 56	6 9	5 23	2 23
15	F	6 13	5 19	3 29	9 4	6 12	5 20	3 28	5 50	6 10	5 22	3 26
16	S	6 14	5 17	4 36	9 54	6 13	5 19	4 35	6 40	6 11	5 21	4 35
17	C	6 16	5 15	rises.	10 43	6 14	5 17	rises.	7 29	6 12	5 19	rises.
18	M	6 17	5 14	5 8	11 27	6 15	5 16	5 12	8 13	6 13	5 18	5 18
19	T	6 18	5 12	5 42	ev. 7	6 16	5 14	5 47	8 53	6 14	5 16	5 53
20	W	6 19	5 11	6 21	0 45	6 17	5 13	6 27	9 31	6 15	5 15	6 33
21	T	6 20	5 9	7 8	1 23	6 18	5 11	7 12	10 9	6 16	5 14	7 18
22	F	6 21	5 8	7 56	2 8	6 19	5 10	8 2	10 54	6 17	5 12	8 8
23	S	6 23	5 6	8 50	3 1	6 20	5 9	8 56	11 47	6 18	5 11	9 2
24	C	6 24	5 5	9 48	3 37	6 21	5 7	9 54	ev. 23	6 19	5 10	9 59
25	M	6 25	5 3	10 49	4 25	6 23	5 6	10 53	1 11	6 20	5 8	10 57
26	T	6 26	5 2	11 50	5 16	6 24	5 4	11 54	2 2	6 21	5 7	11 57
27	W	6 28	5 0	morn	6 10	6 25	5 3	morn	2 56	6 22	5 6	morn
28	T	6 29	4 59	0 53	7 5	6 26	5 2	0 55	3 51	6 23	5 5	0 57
29	F	6 30	4 58	1 57	7 58	6 27	5 0	1 58	4 44	6 24	5 3	1 59
30	S	6 31	4 56	3 3	8 49	6 28	4 59	3 3	5 35	6 25	5 2	3 3
31	C	6 33	4 55	4 12	9 41	6 30	4 58	4 11	6 27	6 26	5 1	4 9

Plymouth Rock Fowls. By F. H. Corbin, Newington, Ct. March 27, 1879.
Prizes on American Butter at the Royal Society's London Show. July 10, 1879.
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Sears, D. Edward, Elmwood, Conn. Obituary. March 6, 1879.
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MOON'S PHASES.	D.	BOSTON. H. M.	NEW-YORK. H. M.	WASHINGT'N H. M.	SUN ON MERID. D.	H. M. S.
NEW MOON,....	2	11 11 mo.	10 59 mo.	10 47 mo.	1	11 43 41
FIRST QUARTER,	9	3 36 mo.	3 24 mo.	3 12 mo.	9	11 44 2
FULL MOON,....	16	3 55 ev.	3 45 ev.	3 31 ev.	17	11 45 16
THIRD QUARTER	24	9 11 ev.	8 59 ev.	8 47 ev.	25	11 47 23

CALENDAR

For Boston, New-England, New-York State, Michigan, Wisconsin, Iowa, and Oregon.

CALENDAR

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CALENDAR

For Washington, Maryl'd, Virginia, Kent'ky, Miss'ri, and California.

DAY OF MONTH.	DAY OF WEEK.	SUN RISES	SUN SETS.	MOON RISES.	H. W. BOST'N	SUN RISES	SUN SETS.	MOON RISES.	H. W. N. Y.	SUN RISES	SUN SETS.	MOON RISES.
		H M	H M	H M	H M	H M	H M	H M	H M	H M	H M	H M
1	M	6 34	4 54	5 24	10 36	6 31	4 57	5 21	7 22	6 28	5 0	5 18
2	T	6 35	4 52	sets.	11 29	6 32	4 56	sets.	8 15	6 29	4 59	sets.
3	W	6 36	4 51	5 22	morn	6 33	4 54	5 28	9 4	6 30	4 58	5 34
4	T	6 37	4 50	6 18	0 18	6 34	4 53	6 24	9 51	6 31	4 57	6 31
5	F	6 39	4 49	7 23	1 5	6 35	4 52	7 29	10 44	6 32	4 56	7 36
6	S	6 40	4 48	8 34	1 58	6 37	4 51	8 40	11 39	6 33	4 55	8 46
7	C	6 41	4 46	9 48	2 53	6 38	4 50	9 52	morn	6 34	4 54	9 57
8	M	6 43	4 45	11 1	3 48	6 39	4 49	11 4	0 34	6 35	4 53	11 8
9	T	6 44	4 44	morn	4 44	6 40	4 48	morn	1 30	6 36	4 52	morn
10	W	6 45	4 43	0 12	5 43	6 41	4 47	0 14	2 29	6 37	4 51	0 16
11	T	6 46	4 42	1 20	6 43	6 43	4 46	1 21	3 29	6 39	4 50	1 22
12	F	6 48	4 41	2 27	7 38	6 44	4 45	2 27	4 24	6 40	4 49	2 26
13	S	6 49	4 40	3 33	8 29	6 45	4 44	3 32	5 15	6 41	4 48	3 30
14	C	6 50	4 39	4 38	9 21	6 46	4 43	4 35	6 7	6 42	4 47	4 33
15	M	6 51	4 38	5 42	10 11	6 47	4 42	5 39	6 57	6 43	4 47	5 35
16	T	6 53	4 37	rises.	11 0	6 48	4 41	rises.	7 46	6 44	4 46	rises.
17	W	6 54	4 37	5 0	11 45	6 50	4 41	5 7	8 31	6 45	4 45	5 13
18	T	6 55	4 36	5 49	ev. 24	6 51	4 40	5 55	9 10	6 47	4 44	6 1
19	F	6 56	4 35	6 42	1 2	6 52	4 39	6 48	9 48	6 48	4 44	6 54
20	S	6 57	4 34	7 39	1 43	6 53	4 39	7 44	10 29	6 49	4 43	7 50
21	C	6 58	4 34	8 38	2 24	6 54	4 38	8 43	11 10	6 50	4 43	8 48
22	M	7 0	4 33	9 39	3 6	6 55	4 37	9 42	11 52	6 51	4 42	9 46
23	T	7 1	4 32	10 40	3 49	6 56	4 37	10 42	ev. 35	6 52	4 41	10 45
24	W	7 2	4 32	11 42	4 33	6 58	4 36	11 43	1 19	6 53	4 41	11 45
25	T	7 3	4 31	morn	5 22	6 59	4 36	morn	2 8	6 54	4 41	morn
26	F	7 5	4 30	0 44	6 15	7 0	4 35	0 45	3 1	6 55	4 40	0 45
27	S	7 6	4 30	1 50	7 12	7 1	4 35	1 50	3 58	6 56	4 40	1 49
28	C	7 7	4 30	2 59	8 9	7 2	4 34	2 57	4 55	6 57	4 39	2 55
29	M	7 8	4 29	4 11	9 7	7 3	4 34	4 8	5 53	6 58	4 39	4 5
30	T	7 9	4 29	5 25	10 10	7 4	4 34	5 21	6 56	6 59	4 39	5 17

Stock Breeding. By Dr. Manly Miles. New-York: D. Appleton & Co. Nov. 14, '78.
Sturtevant, Jos. N., South Framingham, Mass. Obituary. Jan. 30, 1879.
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Sylvester, E. Ware, Lyons, N. Y. Obituary. April 10, 1879.
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Value of Our Agricultural Exports for 1878, $542,230,772. March 20, 1879.
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MOON'S PHASES.	D.	BOSTON. H. M.	NEW-YORK. H. M.	WASHINGT'N H. M.	SUN ON MERID. D.	H. M. S.
NEW MOON, ...	1	10 12 ev.	10 0 ev.	9 48 ev.	1	11 49 30
FIRST QUARTER,	8	1 54 ev.	1 42 ev.	1 30 ev.	9	11 52 54
FULL MOON, ...	16	10 52 mo.	10 40 mo.	10 28 mo.	17	11 56 42
THIRD QUARTER	24	2 13 ev.	2 1 ev.	1 49 ev.	25	12 0 41
NEW MOON, ...	31	9 12 mo.	9 0 mo.	8 48 mo.	31	12 3 37

CALENDAR For Boston, New-England, New-York State, Michigan, Wisconsin, Iowa, and Oregon.

CALENDAR For New-York City, Philadelphia, Connecticut, N. Jersey, Penn., Ohio, Indiana and Illinois.

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DAY OF MONTH.	DAY OF WEEK.	SUN RISES	SUN SETS.	MOON RISES.	H. W. BOST'N	SUN RISES	SUN SETS.	MOON RISES	H. W. N. Y.	SUN RISES	SUN SETS.	MOON RISES.
		H M	H M	H M	H M	H M	H M	H M	H M	H M	H M	H M
1	W	7 10	4 29	sets.	11 11	7 5	4 33	sets.	7 57	7 0	4 39	sets.
2	T	7 11	4 28	5 2	morn	7 6	4 33	5 9	8 53	7 1	4 38	5 16
3	F	7 12	4 28	6 14	0 7	7 7	4 33	6 21	9 42	7 2	4 38	6 26
4	S	7 13	4 28	7 30	0 56	7 8	4 33	7 35	10 34	7 3	4 38	7 40
5	☾	7 14	4 28	8 46	1 48	7 9	4 33	8 50	11 24	7 4	4 38	8 54
6	M	7 15	4 27	10 0	2 38	7 10	4 33	10 3	morn	7 5	4 38	10 5
7	T	7 16	4 27	11 11	3 28	7 11	4 33	11 12	0 14	7 6	4 38	11 14
8	W	7 17	4 27	morn	4 18	7 12	4 33	morn	1 4	7 7	4 38	morn
9	T	7 18	4 27	0 20	5 9	7 13	4 33	0 20	1 55	7 7	4 38	0 20
10	F	7 19	4 27	1 26	6 5	7 14	4 33	1 25	2 51	7 8	4 38	1 23
11	S	7 20	4 27	2 31	7 1	7 14	4 33	2 29	3 47	7 9	4 38	2 26
12	☾	7 20	4 28	3 35	7 58	7 15	4 33	3 32	4 44	7 10	4 38	3 28
13	M	7 21	4 28	4 37	8 50	7 16	4 33	4 33	5 36	7 10	4 38	4 29
14	T	7 22	4 28	5 35	9 42	7 17	4 33	5 32	6 28	7 11	4 39	5 27
15	W	7 23	4 28	6 33	10 35	7 17	4 34	6 27	7 21	7 12	4 39	6 22
16	T	7 24	4 29	rises.	11 23	7 18	4 34	rises.	8 9	7 13	4 39	rises.
17	F	7 24	4 29	5 31	ev. 4	7 19	4 34	5 37	8 50	7 13	4 40	5 43
18	S	7 25	4 29	6 30	0 42	7 19	4 35	6 34	9 28	7 14	4 40	6 40
19	☾	7 25	4 30	7 30	1 17	7 20	4 35	7 34	10 3	7 14	4 40	7 38
20	M	7 26	4 30	8 31	1 56	7 20	4 35	8 34	10 42	7 15	4 41	8 36
21	T	7 26	4 30	9 31	2 34	7 21	4 36	9 33	11 20	7 15	4 41	9 35
22	W	7 27	4 31	10 33	3 12	7 21	4 36	10 34	11 58	7 16	4 42	10 34
23	T	7 27	4 32	11 36	3 54	7 22	4 37	11 35	ev. 40	7 16	4 42	11 35
24	F	7 28	4 32	morn	4 39	7 22	4 38	morn	1 25	7 17	4 43	morn
25	S	7 28	4 33	0 41	5 32	7 23	4 38	0 39	2 18	7 17	4 44	0 38
26	☾	7 29	4 33	1 49	6 33	7 23	4 39	1 46	3 19	7 18	4 44	1 43
27	M	7 29	4 34	3 0	7 37	7 23	4 39	2 56	4 23	7 18	4 45	2 52
28	T	7 29	4 35	4 12	8 43	7 24	4 40	4 8	5 29	7 18	4 46	4 3
29	W	7 29	4 36	5 24	9 51	7 24	4 41	5 18	6 37	7 19	4 46	5 13
30	T	7 30	4 36	6 29	10 58	7 24	4 42	6 24	7 44	7 19	4 47	6 18
31	F	7 30	4 37	sets.	11 55	7 24	4 43	sets.	8 41	7 19	4 48	sets.

Vermont Merino Sheep Breeders' Register. By Albert Chapman, Secretary. Jan. 23; Feb. 20, 1879.
Vermont State Board of Agriculture—5th Annual Report. H. M. Seely, Sec. Jan. 23, '79
Veterinary Obstetrics. By Prof. George Fleming. New-York: Albert Cogswell. April 10, 1879.
Virginia State Agricultural Report for 1878. March 20, 1879.
Woodward, L. L.. Antwerp, N. Y. Obituary. March 6, 1879.

THE

ILLUSTRATED ANNUAL REGISTER

OF

RURAL AFFAIRS.

ORNAMENTAL FARM GROUNDS.

IN FORMER VOLUMES OF RURAL AFFAIRS we furnished our readers with a number of designs for ornamental grounds, mostly for small lots or for village residences where a limited extent of ground was to be occupied. We propose on the present occasion to give a few designs specially adapted to farm residences, and partly with a view to bring a portion of the farm itself into the design, without occupying much of the land exclusively for ornamental purposes. The reduction of such designs to practice will not only make country homes more attractive to the farmer's sons and daughters, but it will stimulate to greater neatness in the condition of the farm and in the removal of all obstructions to profitable culture, in order that something of the finished appearance of the home grounds may extend beyond their proper boundaries to the adjacent fields.

An essential requisite in securing such homes, is to give the whole farm, or at least the nearer portions, a neat appearance by removing all disfiguring or repulsive objects, giving outhouses a pleasing exterior, providing finished fences, and planting lines or belts of trees where they may act as screens against severe winds. The orchards in near proximity to the dwelling should be planted with the more symmetrical growers, as with such pears and cherries as have regular outlines of form.

It is not necessary to incur much expense in thus beautifying country homes. The farmer with small means may plant a half acre around his dwelling so as to present a small landscape appearance, and cut the grass rapidly once a week with a hand lawn-mower. He may cut a few circular flower beds in the turf, in which shape they are easily kept in order. The owner of a large farm may devote several acres to the same purpose, give his plantings a more park-like appearance, and keep the grass short by the grazing of a flock of sheep. Many would be satisfied with this arrangement, while others would wish a smaller portion of the grounds near the house shut off from these sheep with a wire fence, using the lawn-mower for it, and plant with small shrubs and flowers, as one's preferences might demand.

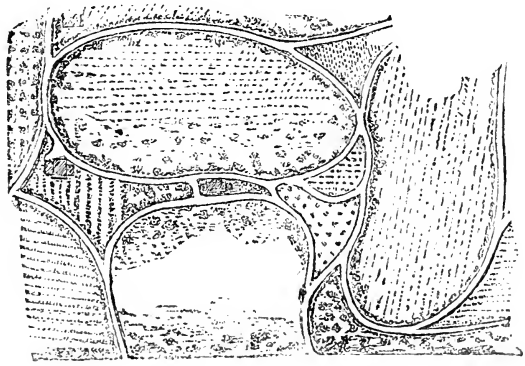

Fig. 133.—*Ornamental Farm.*

We furnish a few plans in illustration of these suggestions, in which greater or less attention is given to ornamental effect. The first, shown in fig. 133, represents an ornamental farm, the outlines of the fields laid out in curved lines and bordered with carriage drives. This farm is not occupied by the man whose chief object is to make money from his land, but by the owner who wishes to combine with a pleasant home the comforts and luxuries to be had from the soil. One-half of his farm, including the portion represented, may be laid out in this way, and the remain-

der with fields in a more regular form (as shown by fig. 134) or the whole farm may be arranged in this ornamental style. The carriage roads are not merely for ornament; they afford ready means to their owner for reaching in a wheeled vehicle any part of his farm, and they give free access to the fields for work, for drawing manure and for removing the crops.

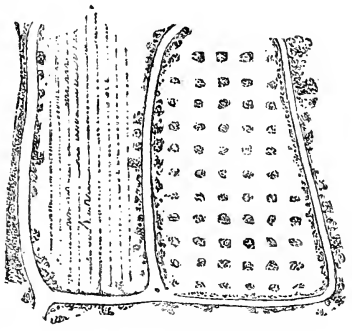

Fig. 134.

If the soil is light or gravelly, it will form the material for these roads, except the portions near the residence; if clayey, a good tile drain should extend the whole length under them, and a covering of gravel in addition may be necessary.

The fences for the boundaries of the fields may be buckthorn or other low-growing hedge, with a barbed wire stretched lengthwise through the centre. This wire will preclude the intrusion or passage through it of cattle, while the hedge itself will prevent their striking and becoming injured by rushing against the barbs. If the fields are not to be occupied as pasture, but only with meadows or cultivated crops, there will be no necessity for this barrier.

Very few owners of farms will care to adopt this mode of ornament; and it should not be chosen without ample means to keep the whole place in neat and finished condition, and the fields under high culture. The expense, however, of keeping such a place of moderate extent in good order, in connection with the cultivation of the farm, would be far less than that of maintaining a place of equal size devoted exclusively to ornamental or landscape planting. It would be well adapted to a fruit farm, and, if properly managed, a high degree of ornament, as well as of profit, might be derived from it.

Fig. 135 exhibits a finished farm laid out in straight lines and rectangles. This mode can be strictly adopted only in those regions of country which are nearly level, or which have but a moderate slope. The same general style may however be adopted among hills by varying the outlines of the fields according to the principles laid down in the plans on page 135 of the second volume of RURAL AFFAIRS. In the plan which is here presented, which is well adapted to a farm of two hundred acres or so, or to a smaller one, there are nine principal fields of about twenty acres each, beside the orchards and home grounds. Every field is reached by a road, without resorting to the common objectionable practice of passing through another field. The boundaries of the farm as well as of

its subdivisions are lined with shade or timber trees. These lines of trees, if set out alternately of trees of different ages, or at different times, may be cut for timber by taking alternately the large ones, leaving the smaller to remain. They will form screens against the severity of the winds in all places where much exposed, and prove of value in the way of shelter to the crops. Such trees should be selected as do not exhaust the soil by long extended roots. The elm, for this reason, should be rejected, and such trees as the oaks and black birch chosen.

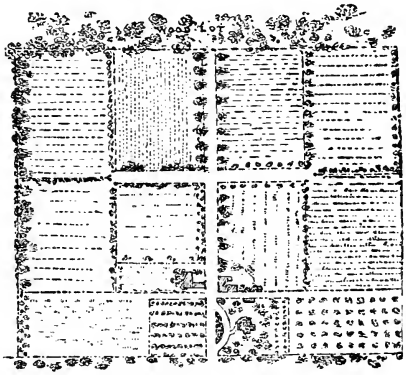

Fig. 135.—*Regular Ornamental Farm.*

It will be seen that a few acres only are occupied by the dwelling and its ornamental surroundings, which may be planted with large shade trees, and the grass beneath them cropped short at no expense by a flock of sheep; or more elaborate grounds may be kept in order with a hand or horse lawn-mower. After such a farm is laid out and planted, it will cost no more to keep it in neat order than any other farm—unless indeed it be one where the whole aim is to make money without affording any attractions to the home where the family is to spend the whole of their days, and where not a shade tree or a flowering shrub is planted; where the public road is made into a barnyard, and the house surrounded with unadorned bleakness.

Fig. 136 represents the front portion of a farm, occupied with the dwelling, barn and surroundings. On the left of the house, and in its rear, is the kitchen garden, arranged so as to be cultivated with a horse through its entire length. Small orchards are on the right and left. In the rear of the barnyard is a calf pasture, sheltered on three sides with screens of Norway spruce, and the barnyard is partly sheltered in the same way. An evergreen

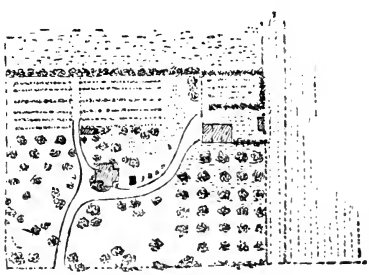

Fig. 136.—*Front Portion of Farm.*

screen, when sufficiently grown, is equal to an open shed. Such a shelter is represented on page 222 of the fifth volume of RURAL AFFAIRS, and its general appearance surrounding the barn is shown by fig. 137. The

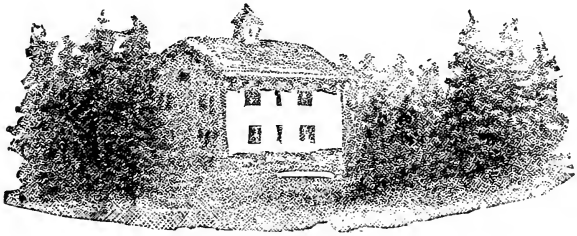

Fig. 137.—*Screen around Barnyard.*

farm road on the right side of the plan is near the middle of the farm, and affords ready access and exit for all heavy loads to or from the farm, without cutting up the separate carriage road at the dwelling.

Fig. 138 is a plan of grounds where it is desired to give a breadth of shade, as well as exclusion near the public road, without occupying much of the farm for ornamental purposes—the dwelling being quite shut in from the public by dense plantings. The carriage entrance is at one side, and a small walk opposite gives access and exit on that side of the house.

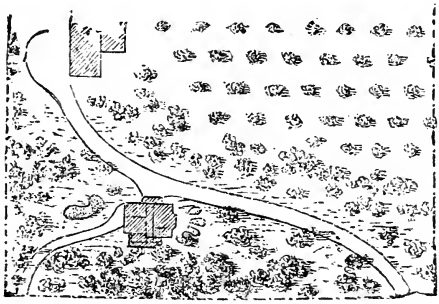

Fig. 138.—*Secluded Residence near Public Road.*

In the rear of the dwelling the planting is more symmetrical, so as to harmonize in part with the orchards farther back. These plantings may be of the more regular in outline of the small ornamental trees, and gradually pass to such fruit trees as assume a good outline and grow well in grass, as the Buffum, Boussock and Tyson pears, and the Early Richmond, Morello and Downer's Late cherries. The orchard is laid out on the hexagonal plan, which gives more variety to the outline at the same

time that straight lines may be adopted. This mode of planting is shown in detail on page 276, vol. I of RURAL AFFAIRS.

In planting the ornamental gardens of all these various designs, they may consist of beds cut in the smoothly shaven turf (the circular form being the most convenient) away from the shade of trees, where the flowers can have the full benefit of sunlight, as shown in fig. 139; or they may be

Fig. 139.—*Open Garden.*

flanked with the growth of trees and large shrubs, as shown in the vignette at the head of this article. For this shaded garden, flowering shrubs may be more largely employed than bedding plants, and such flowering plants selected as will flourish in a partial shade.

FRUIT HOUSES AND FRUIT ROOMS.

FARMERS WHO RAISE A SUPPLY OF APPLES and other fruits, usually sell at once the surplus, and keep enough for their own use in cellars. The best mode for retaining this home supply is an important question. Every family should have the benefit daily of fresh or cooked fruit from the time of early ripening in summer, till the appearance of strawberries the following season.

But a large portion is often lost through want of suitable apartments. Cellars may be too warm and damp, and decay commence soon after the fruit is stored. Impurities and foul air may impart to it a bad flavor. Even those who take the pains to make smooth and hard cement floors, which are kept scrupulously clean, lose much from a want of regulated ventilation. To prevent this loss and disappointment, and to point out an easy mode by which apples may be kept sound and fresh through winter and spring, and pears till after mid-winter, is the object of the present remarks.

Rooms for keeping fruit are constructed with two distinct objects in view—retaining it for a moderate family supply; and holding it over in large quantities for spring sales, when the low prices of autumn have passed to the high rates of approaching summer. The former are

needed for every family; the latter only for large orchardists and fruit dealers.

The family fruit-room should therefore be as cheap in construction, and as easy in management as will be admissible with success. It may occupy a portion of the cellar under the dwelling, or it may be placed beneath a barn or other outhouse. The latter would be less ready of access, while it would have some special advantages. It should be away from all bad odors, which soon ruin fruit. Owners will generally prefer the house cellar. In this case it will be absolutely necessary to secure an apartment separate from the rest of the cellar, where proper ventilation may be constantly given, and all odors excluded.

An 8-inch brick wall may form the partitions for this room. A cement floor will prevent too much dampness, and assist in securing perfect cleanliness. Both of these objects will be assisted by cementing the side walls. If the subsoil is porous gravel, the room may be dry enough, but it cannot be kept clean without the cement floor. For purposes of ventilation, windows should be inserted in at least two sides, and if opposite, it will be still better. They are to be hung on hinges and supplied with hooks, so as to be partly or wholly opened. On the approach of winter, and as soon as the room is filled with fruit, frequent attention will be necessary to keep the temperature, if possible, only a few degrees above freezing. One or two thermometers will serve as a guide. If the weather is mild, the windows may be opened for the night, and shut during the day. While the cold of winter lasts, they may be opened to such a de-

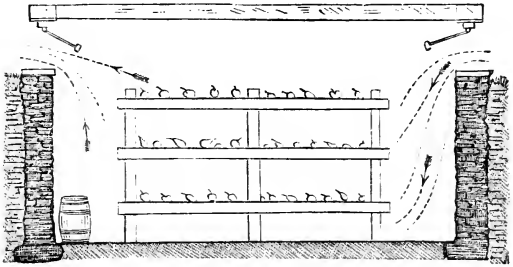

Fig. 140.—*Cross-Section of Fruit-Room, showing Shelves and Air Currents.*

gree as to maintain the low temperature mentioned. A sufficient circulation will thus be maintained in the air, which being colder from outside, will immediately fall to the floor on entering, move over the bottom, and pass out at the opposite lee side. The difference between the keeping of fruit thus managed, and such as may be carelessly placed in common cellars, will surprise those who have not seen both modes tried. The last mentioned will decay before spring, the former may be kept till summer.

Fig. 140 represents the cross-section of a fruit-room in a cellar, the

windows being opened on opposite sides, the cold air falling as it enters, and the warm air rising and passing out on the opposite side.

A more perfect fruit-room in the basement of a dwelling (fig. 141) may be made by additional security against the entrance of warm air, and by drawing in cold air during cool nights by artificial ventilation. When this is done, the low temperature is retained, should the weather become

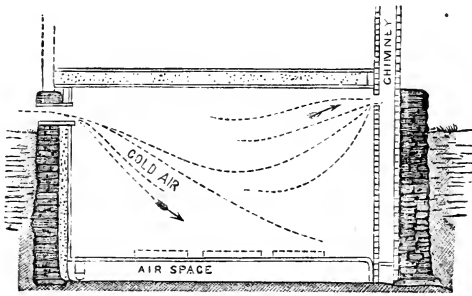

Fig. 141.—*Cross-Section of Fruit-Room, with Artificial Ventilation.*

warmer, by carefully shutting every avenue. It has an air-space beneath the floor and a space filled with sawdust above. It is well to line the walls with tarred or building paper, in which case the space need not be so thick. The windows may be double glazed, and there should be a small entry, with two doors for passing into the room. In order to draw the cold air into this room from without, it should be connected with the kitchen or other chimney, in which an upward current of air is caused by the fire. This connection may be made by means of stove-pipe or other air tube. Whenever a cold night occurs, the windows and the register in the air-pipe are thrown open; the current in the chimney withdraws the air from the fruit-room, and the cold air from without rushes in to supply its place. Early the next morning the windows and register are closed; the low temperature thus obtained will continue through the day. If the walls and ceiling are lined and packed with saw-dust, the cold air will be retained for several days. By the use of thermometers, a uniformly low temperature may be maintained until cool nights in spring come to an end. The dotted lines at the floor below show the board registers which are opened in warm weather to admit the earth-cooled air, which is drawn up by the chimney current.

A still more perfect fruit-house is made by constructing a separate building wholly above ground; or if there is a natural drainage to the soil, it may be sunk a foot or two. The walls may be wholly of wood, or may be constructed of brick or stone outside, and wood inside, with a space between them; or they may consist of two board partitions a foot apart. Or there may be three separate brick walls, with air-spaces

between them, the central one with brick on edge, with the necessary brick cross-ties. The house should be built high enough to allow a chamber overhead to serve as an entrance to the fruit-room below, which is reached by stairs. The advantage of this arrangement is that the warm air will not readily descend into the fruit-room, and its lower temperature will be more perfectly maintained than through a side entry. Wooden tubes for ventilation pass through the chamber above with openings which may be easily closed at the ends, for the admission of cold air. The precise temperature of the room below may be easily ascertained at any time without admitting warm air in entering it, by providing vertical rods of wood about two inches square, which slide up and down through the floor near the wall, and are secured with fastenings like those of windows. A thermometer is placed in a niche cut in the lower end of the rod, so that it is drawn up and examined by the attendant in the apartment above.

The fruit houses erected by N. and J. Cope of Ohio, for an account of which we are indebted to M. B. Bateham, are constructed on a similar principle. They are about 50 feet long by 25 feet wide, and will hold 4,000 or 5,000 bushels. The walls are made with two sills on the stone foundation, and with two rows of studding, secured from spreading by cross-ties, giving a space of 12 or 15 inches between the boards, to be filled with sawdust. Mr. Bateham thinks this space should not be less than 15 inches in order to make it perfectly frost-proof and air-tight. The ceiling over the fruit-room and beneath the upper floor is filled in with sawdust like the walls. The floor of the fruit-room has the joists run lengthwise with the building, supported by a cross-sill in the middle, and this rests on stone piers, to prevent any sagging by the weight above. Spaces between some of the joists are formed into air ducts extending from each end to the middle, and openings are left at their ends, like cellar windows for the admission of air into these ducts. Iron grating excludes rats and mice, and a shutter excludes the air. In very cold weather the spaces may be filled with straw, Spaces are cut in the floor over the ducts to allow the air from without to enter the room; these are about a foot square and five feet apart, and are covered with iron or wooden grates.

In the fruit house of N. Cope the regulation of the temperature is effected entirely by natural ventilation, the warmth in the apartment above drawing the air upward through the air tubes.

J. Cope in his patented fruit-house employs artificial heat, and effects a more rapid change of air. The air tubes are stovepipes connected with one or more small stoves in the upper apartment, which when heated produce rapid upward currents of air from the fruit room, the cold air rushing in below at the same time. The doors are only opened to receive the fruit, and are double and packed. The stairs are either outside or in a separate entry, and care is taken not to open the room either in warm

or very cold weather. A slatted floor admits the natural heat from the earth.

An excellent mode is adopted for filling these houses, by using crates holding each about a bushel and a half, which are filled in the orchard, carried in and piled regularly in the fruit-room, the fruit not being disturbed from the time it is picked in the orchard until the following spring.

The cost of these houses is moderate. They are used for keeping apples in large quantities for spring markets. The room is kept dark, except by the admission of light from a single double window, in storing the fruit.

An important improvement may be made in this fruit house by substituting Mott's or Espy's ventilator caps, or the one represented on page 154 of vol. VII of RURAL AFFAIRS, for producing air currents in place of the artificial heating by stoves. These ventilator caps, and Mott's most conspicuously, produce an upward current in the chimney to which they are attached, whenever the wind blows, even in the absence of any fire. If, therefore, they are attached to the air tubes over the building, cold air may be thrown into the fruit-room through their agency, whenever there is any external breeze. By closing the registers after this is effected the cold air is retained. It is often important to cool the fruit rapidly, when at mid-autumn it has been placed in the fruit-room. This process is readily effected in the manner described, and entirely obviates the labor of first storing the fruit in a cool outhouse in autumn, and then removing it again to its winter destination.

The Boston Journal of Chemistry gives the following description of a good fruit house:

"Ten years ago we constructed a fruit cellar under our stable, and it has proved so satisfactory that we venture to give a brief description of it. The division walls are constructed of brick, and the apartments are two in number, an outer and an inner room. The outer room is but partly underground, and is 10 by 12 feet in area, and 8 feet high. The inner room is wholly underground, and frost proof; it has four brick walls and a cemented floor. In this room the fruit is stored early in December, when the weather becomes cold. The outer room holds the fruit during the autumn months after it is gathered, and it is cool, well lighted, and dry.

"The windows are left open and a free circulation of air allowed so long as no danger from frost exists. When the fruit is taken to the inner room, the door is closed, and no light admitted. Ventilation is secured in moderate weather by opening the inner door and throwing down a window in the outer room. In this cellar we kept apples of last season's growth until the present winter in perfect condition. Some of these apples, exhibited at the autumn agricultural fairs, were pronounced as fresh as those of the past season's growth."

Modes of Storing Fruit.

For daily family use, fruit should be placed so as to be readily accessible. The most convenient arrangement consists in a succession of shelves, one above the other, in the centre of the fruit room, with a passage around them next to the walls. If about five feet wide, the centre may be easily reached from the passages. Specimens which show indications of decay are easily selected for daily use, and the hard and sound ones retained for longer keeping. These shelves may be about two feet apart, so as to afford ready access in assorting. A plan of the room is shown in the accompanying figure, (fig. 142.)

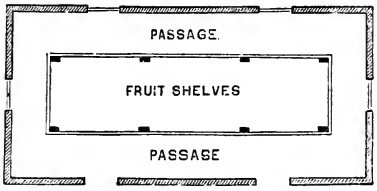

Fig. 142.

By constant and careful selection and removal of the most perishable specimens, sound fruit may be had until late in spring; when a portion of the soundest, placed in shallow boxes beneath and closely fitting under the lower shelf and on the cold floor, may be kept till mid-summer. By the adoption of this method we have a daily supply of such apples as the Baldwin till the middle of July, in a sound, crisp and juicy condition.

When secured in close barrels apples will keep longer, being protected from air currents, and from changes of temperature. The trouble is we cannot see when decay commences. None but long keepers should therefore be stored in barrels. Some experience will enable the owner to know how long the barrels may be safely left unopened. It may be well to provide shelves as well as a space for storing the barrels, according to the plan shown in fig. 148. Fruit for daily use may occupy the shelves; long keepers can be packed in barrels.

When apples are packed in boxes in the orchard, it is well to pile them up, in a sheltered place, as shown in fig. 143. This mode admits the free

Fig. 143.—*Piling Fruit Boxes.*

circulation of air, and they may be protected from the weather by a board cover. As winter approaches, they are conveyed to the cellar or fruit room without disturbing their contents. Or if they are received in a cold fruit house, the fresh fruit may be at once conveyed to it.

When packed away for winter, the boxes may be disposed of as shown

in fig. 144, and when they are examined for the removal of decaying specimens, the boxes are taken down one at a time, and replaced in a new pile. It will obviate the necessity of disturbing or turning over the fruit for examination, if the boxes are quite shall low or only 3 or 4 inches deep, so as to contain only a single layer of specimens. They should have slatted bottoms, to admit the circulation of the cool air. If the lumber of which they are made is sawed of the right width, they are rapidly constructed by nailing together. A convenient size for the boxes is 20 by 24 inches, with slats at the bottom two inches wide and three-fourths of an inch apart. They will be cheaper for the same contents if six inches deep; but the fruit is more easily picked over when in a single layer with a depth of only three inches.

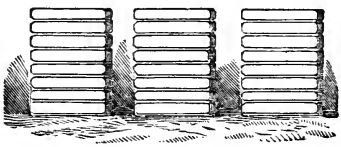

Fig. 144.—*Storing Fruit Boxes.*

When barrels are stored in the fruit-room, it is recommended to place them on their sides, as shown in fig. 145. It is often more convenient, however, to deposit them on end, in which case they keep nearly if not quite as well. By placing a broad board on the top of the lower tier, the next may be set upon it, as shown in fig. 146.

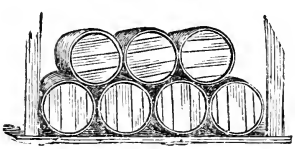

Fig. 145.

Fig. 146.

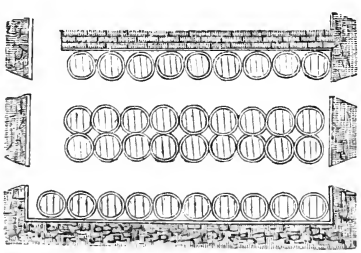

Fig. 147.—*Arrangement of Barrels.*

If barrels are wholly used, they may be deposited on their ends in the fruit-room, as represented in fig. 147; or the double tier through the middle may be changed to a single one with the barrels resting on their sides.

Fig. 148 is the plan of a fruit-room with shelves in the centre for the

more perishable sorts, with space enough for a row of barrels along each side, containing the long keepers.

It is well to estimate beforehand the required contents of a fruit-room. One arranged wholly for barrels, as in fig. 148, will hold nearly 200 bushels, if the tiers of barrels are five feet high. With shelves in centre as in fig. 149, the same room will hold about two-thirds as much, shelves requiring more than double the space occupied with barrels for the same capacity.

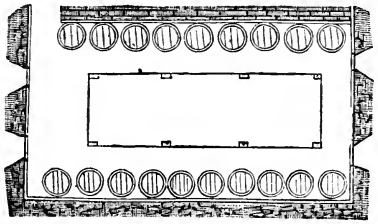

Fig. 149.—*Barrels and Shelves.*

We have found a series of drawers, represented at fig 150, more convenient and more compact for keeping apples and pears than any other mode. The drawers are 3 inches deep and the sides measure 3 by $3\frac{1}{2}$ feet. They have slatted bottoms. With a single layer each one holds about a bushel. The case of drawers is 8 feet long, 3 feet wide and 6 feet high. The pieces are all cut of the right size, the drawers made, and the rest of the work completed in the fruit-room. Nails are exclusively used for all the parts. The shelves slide on strips an inch square, which keep the shelves an inch apart for

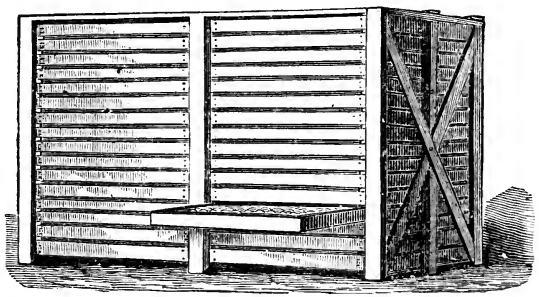

Fig. 150.—*Thirty Drawers for Apples and Pears, holding Thirty Bushels.*

the admission of air, and for grasping the sides when drawing them out. They sustain themselves firmly in their position when drawn out within 6 inches of the rear side. Board partitions at their sides keep them in their places. The thirty drawers will hold thirty bushels, which is a larger quantity than can well be packed in any other form. The upper ones are examined from a step-ladder. The whole cost, including drawers, lum-

ber, nails and work, was only $20. Any desired number of these cases may be placed in a fruit-room.

In conclusion, the following rules may be presented for strict observance in keeping fruit:

1. Let the temperature be kept as near the freezing point as practicable.

2. Keep the temperature as uniform as possible, as an occasional warm draught hastens decay.

3. Exclude air currents of any kind not required to maintain a uniform degree of cold; hence drawers or covered boxes are better than open shelves.

4. Keep all odors away from the fruit, especially such odors as come from badly kept cellars.

THE NEWER PEARS.

AMONG THE MANY HUNDREDS OF NEW PEARS which have been introduced of late years there are few which deserve special attention on account of their excellence or desirable qualities. Among the most valuable new sorts we give notices and descriptions of the following, to which others may be added in the future:

JONES' SEEDLING (fig. 151.)—Its origin was near Philadelphia. In size it is below medium, form obovate, acute at the stem, often with a slight suture from stem to crown; nearly the whole surface is covered with a thin cinnamon russet on a yellowish skin, often reddened towards the sun; stalk fleshy at base; calyx large, spreading; flesh buttery and very juicy, with a slightly acid or nearly sweet flavor; "very good." Downing gives October as its period of ripening, but the specimens we have raised are not mellow till January, and its keeping qualities are among its chief merits. Its small size will prevent its becoming popular.

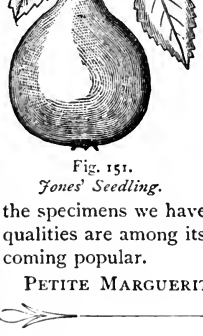

Fig. 151.
Jones' Seedling.

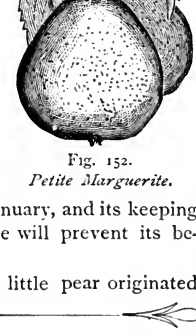

Fig. 152.
Petite Marguerite.

PETITE MARGUERITE (fig. 152.)—This excellent little pear originated

on the grounds of Andre Leroy of Angers. The fruit is rather below medium in size, short obovate pyriform (Madeleine-shaped), surface slightly uneven; skin greenish yellow, becoming pale yellow, brown to the sun, dots numerous, greenish; stalk long, slender, set in a narrow and rather deep cavity: basin rather large, somewhat wrinkled; flesh white, buttery and melting, sweet, very good. It ripens the latter part of August; the tree is moderately vigorous and very productive.

FREDERIC CLAPP (fig. 153.)—Since the general introduction of the widely known Clapp's Favorite, produced by Frederic and Thaddeus Clapp, another variety has been brought to notice by Lemuel Clapp, brother of the two former, which promises high value. It was produced from seed of the Urbaniste, crossed by the Beurre Superfin, resembling the latter in flavor. The fruit is rather large, roundish obovate, somewhat variable in form and often irregular; the skin is bright yellow, without blush or russet, but with many minute dots; stalk an inch long, slightly sunk; calyx rather small and nearly closed, set in a shallow basin; flesh light yellow, fine grained, juicy, melting, slightly aromatic, with a high vinous flavor.

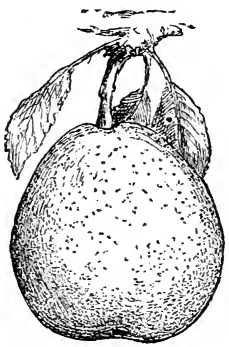

Fig. 153.—*Frederic Clapp.*

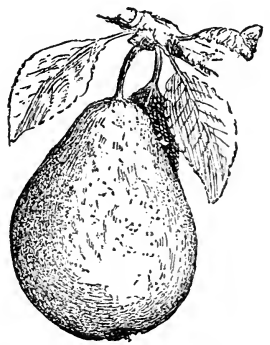

Fig. 154.—*Duhamel du Monceau.*

DUHAMEL DU MONCEAU (fig. 154.)—This fine pear was raised by Andre Leroy of Angers, France. The fruit is full medium in size, pyriform, rounded, regular; skin deep yellow, with a slight brown blush in the sun, with some patches and nettings of russet, the whole surface often a rich cinnamon russet, dots numerous; stalk medium, curved, oblique, scarcely sunk, sometimes lipped; calyx partly closed, in a very shallow, wrinkled basin: flesh a little granular, buttery and very melting; flavor not very rich, but agreeable and delicious. Specimens of this fruit received from Messrs. Ellwanger & Barry the middle of January were as melting as any pear of autumn.

Souvenir du Congres (fig. 155.)—This is a magnificent fruit in appearance when well grown, and although variable in form, size and quality, has attracted much attention from fruit growers. The tree is of vigorous, upright growth. Fruit large, sometimes quite large, long pyriform; surface more or less uneven or wavy, rich yellow, often with a red cheek; stalk curved, slightly sunk; calyx in a deep-furrowed basin; flesh buttery; quality variable, "good," sometimes "very good." Ripens early in September, and continues some weeks. More time is needed to prove the general value of this pear in different parts of the country.

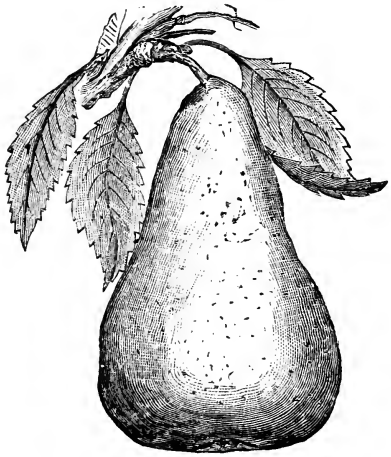

Fig. 155.—*Souvenir du Congres.*

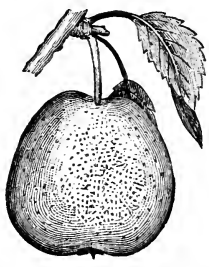

Fig. 156.—*Doctor Reeder.*

Doctor Reeder (fig. 156.)—This is a small and excellent pear, raised from seed of the Winter Nelis, by Dr. Henry Reeder of Seneca County, N. Y. The tree is hardy and vigorous, and an abundant bearer. The fruit is below medium in size, roundish obovate, regular, with an obtuse suture from stem to apex on one side, giving it a slightly flattened form; skin green, becoming yellowish, more or less overspread with thin russet; stalk long, set in a deep, narrow cavity; calyx stiff, open, in a distinct basin; flesh buttery and melting, slightly vinous, musky, rich, "very good." Ripens in October.

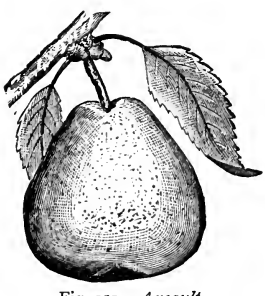

Fig. 157.—*Ansault.*

Ansault (fig. 157.)—This new and delicious variety, more commonly known by its long and impracticable name, *Bonne du Puits Ansault*, originated on

the grounds of Andre Leroy, and has for some years been fruited by Messrs. Ellwanger & Barry of Rochester, N. Y. The fruit is rather below medium in size, short obovate, sometimes slightly pyriform; skin a little rough, pale greenish yellow, thinly russeted; stalk short, in a narrow, deep-ribbed cavity; calyx small, closed in a deep, narrow basin; flesh white, fine grained, juicy and melting, with a peculiar, sweet, slightly vinous, excellent flavor. It ripens in September.

BEURRE SUPERFIN (fig. 158.)—This large and excellent pear, although in cultivation many years, deserves wider attention from the many fruit growers who are but little acquainted with it. It originated in France. The fruit is large, short pyriform; skin greenish becoming yellow, often with a red cheek, and with more or less russet; stalk fleshy at insertion, and set on the acute neck; calyx small, partly closed, in a small, deep-furrowed basin; flesh buttery and melting, very juicy, with a rich and somewhat brisk flavor; in quality "very good." Ripens in October.

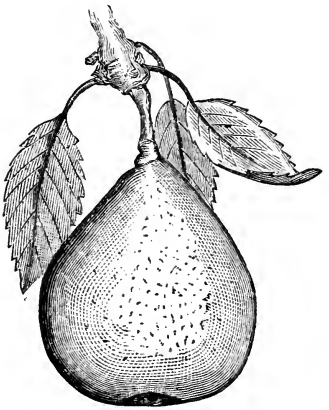

Fig. 158.—*Beurre Superfin.*

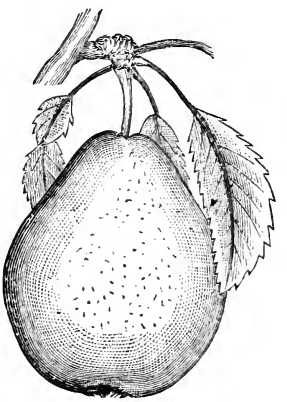

Fig. 159.—*Wilder.*

WILDER (fig. 159.)—This is one of the best of the celebrated new sorts raised by B. S. Fox of San Jose, Cal., and is valuable as a keeper, remaining in good condition till February. It is rather large in size, obtuse pyriform (Diel shaped), rich yellow, a little rough, often slightly reddened in the sun, with numerous dots, and slightly netted with russet; stalk short, in a small cavity; basin shallow, ribbed; flesh light yellow, a little granular, melting, with an exceedingly sweet and excellent flavor; "very good" or "best." It may be smaller when grown east, but will probably lose none of its flavor. Fine specimens have been received by us in different years through Messrs. Ellwanger & Barry.

THE BEAN CROP AND ITS TREATMENT.

By F. P. Root, Monroe County, N. Y.

THE BEAN is one of the most valuable vegetable products of our country, not so much for the extent of its production as for its value as a substantial article of food. It is more nutritious than any of the cereals, and always commands a higher market price. The consumption of beans in the United States has largely increased since the potato has become so uncertain a crop, and since the laboring man has found it much cheaper and an excellent substitute for that almost indispensable vegetable. The production of beans has lately increased far beyond consumption, for we now export annually quite extensively to foreign countries. In some localities it has become one of the staple farm products, and has often been more remunerative than grain crops. In this section it has been, on many farms, a specialty in years past, and much attention has been given to the cultivation and handling of the crop. The thorough farmer who understands the business of bean growing will meet with success, and will find it a remunerative branch of farm husbandry under favorable conditions; but it is more liable to injury from neglect, or from imperfect soil, than most other farm crops.

The bean contains more mineral matter than any of the cereals, and thus requires a soil rich in the organic elements of plant food. According to analyses by Wolff, it contains 29.6 parts of ash in 1,000, while wheat contains but 17.7 parts; the bean contains 12 parts of potash, and wheat but 5.5 parts; of phosphoric acid the bean has 11.6 parts, wheat 8.2 parts; of lime the bean has 1.5 parts, while wheat contains but 0.6 parts. Thus it will be seen that a strong soil is necessary to its production, and that it is more exhaustive than the wheat crop. The best kind of soil is found by experience to be a uniform calcareous loam. A sandy gravel loam will produce a fine sample, but a clay loam will usually afford the best yield. Other soils, if made mellow, will furnish fair crops, but heavy soils are liable to produce a poor quality by uneven ripening. Mucky soils usually produce too much vine, and a poor yield is the result.

Common barnyard manures are beneficial, but should be applied sparingly, so as not to produce an overgrowth. Superphosphate of lime is also as beneficial to this as to any other crop. While a strong soil, in a good state of fertility, is necessary to produce a full crop it is not desirable to have a large amount of vegetable matter in the soil.

Preparation of Land and Planting.

An inverted clover ley, or sod of any kind, provided there are no tenacious grass roots or weeds to grow up and choke the crop, affords a good seed bed, but must be made mellow. The soil must be well worked, and

be made clean and mellow before planting. It should always be freshly worked and moist when planted, so that the seed may all germinate immediately. Fall plowed land well worked in spring up to seeding time will have the seeds of weeds killed, and make the crop easier to till than when plowing is done immediately before planting. The land in all cases should be well worked, and made very fine, not only for the benefit a crop always receives from a well-worked soil, but for the early and uniform germination of the seed.

Beans should not be planted till the ground is warm—usually a week

Fig. 160.—*Bradford's One-Horse Bean-Planter.*

or ten days later than corn planting—in this latitude, from the first to the fifteenth of June. Late varieties, like the late pea bean, should be planted by the first of June. The early pea and medium beans are better if the planting is deferred till June 15th. The pea varieties require half a bushel of seed per acre; the medium three-fourths of a bushel, and the marrows one bushel or even five pecks. Kidney beans, and other large varieties, require more seed, in proportion to the size of beans. The marrows, medium and pea varieties are those most used, and are most hardy and prolific.

The planting is done with a machine drawn by one horse, planting two rows at a time, usually 30 inches apart. After the land is finely harrowed, a light roller should be passed over, to make a smooth surface, so that the seed may be planted at a uniform depth, and in straight rows, to facilitate cultivation. The planting machine is balanced on one wheel, which drives the feeders, and is provided with different sized cups, to meet the requirements of the different sized beans, so as to plant the required quantity of each of the various sorts. It is held by handles like the plow, the holder driving the horse, and will plant some 10 or 12 acres per day. This machine is seen in fig. 160. The cost of this planter is $25, and it is manufactured by Whiteside & Barnett of Brockport, N. Y.

After-Cultivation.

As soon as the plants are up, and put out the second leaves, which is usually about ten days after planting, cultivation should begin. A cultivator is used much like the common one-horse corn cultivator, but the tooth point is of a different shape. It runs nearly flat in the ground, so as to cut the weeds without throwing the earth against the plants. Cultivation should be repeated as often as once every week till the vines begin to run and the blossoms are about to show. If weeds grow along the rows, they must be destroyed by hand hoeing; otherwise all can be done by horse cultivation. The ground must, however, be worked close to the rows without hilling. Beans should not be worked when wet; it causes a rust on the leaves, which is injurious to growth. No crop is more easily injured by neglect, and none pays better for nice, clean cultivation than this. Weeds and thistles, if allowed to grow, will overshadow the low-growing plants, and prevent them from filling the pods full, lessening the yield largely.

Harvesting the Crop.

This crop will mature in from sixty to eighty days after planting, the early varieties, such as mediums and early pea beans, of course in the shortest time. As soon as the pods and leaves change to a yellow hue, and before the pods are dry, the harvest should begin. Harvesting is done, in the old style, by hand pulling, bringing four rows into one of bunches; the stalks inverted, setting the tops on the ground, so that the pods receive the sun to dry them. A week or ten days is necessary to cure in good weather. It is of the first importance that they are dry before putting into a mow, for any moisture sufficient to cause fermentation will greatly damage the crop. On a small scale they are sometimes stacked around stakes driven into the ground, spreading straw around the stake, then stacking the beans around by putting the roots to the stake and the pods hanging on the outside, when they will cure even in wet weather. This is however thought too expensive for extensive field culture, and is not practiced in this section. The only advantage in it is the safety against injury from wet weather, but in ordinary seasons the risk

in drying on the ground is very small. If the weather becomes showery, so that the piles are wet through, they must be turned over, and if wet weather continues several days in succession, it becomes necessary to turn them as often as once in two days, so as to bring those pods which lie on the ground up to the surface, where they will receive air. In this way they can be saved through several days of wet weather, without serious injury, but if allowed to lie on the ground unmoved when wet, they will be injured. Seasons of unfavorable weather at bean harvest time are quite rare, and little trouble is experienced in curing them. When farmers have scaffold room or airy places where they can be spread, beans may be stored when somewhat damp, but when put into mows they must be dry, and all green pods well cured, or the crop will be damaged by stained berries.

Recently the expense of harvesting has been lessened about one-half by the use of harvesting machines. Several different machines have been constructed, though all use the same principle of cutting the stalk an inch or two below the surface of the ground. This is done by means of a sharp steel share drawn diagonally, and attached to standards and a frame

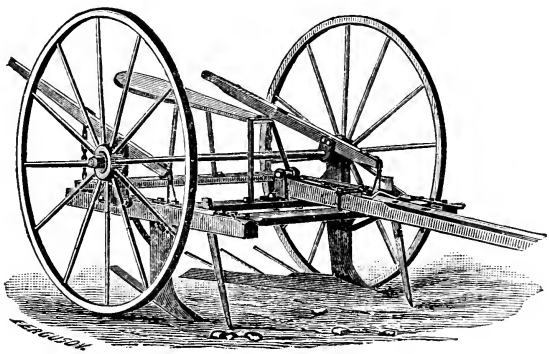

Fig. 161.—*Bradford's Bean Harvester.*

carried on wheels and drawn by two horses. The horses travel between the rows, outside of the two rows which are being cut and brought into one row behind the machine. The driver rides and regulates the depth of cutting by means of a lever. This is necessary to conform to the surface of the ground. The beans, after being partly cured are pitched into piles, bringing four rows into one row of bunches, in order to allow a team to pass between in loading. Beans when thus harvested dry out sooner than when pulled by hand, and if wet by rains are turned quite as easily.

A complete and successful harvesting machine is patented and manufactured by Wm. Bradford, Brockport, N. Y., a cut of which is seen in fig. 161.

It has two cutting blades which run forward obliquely just beneath or at the surface, each one cutting a row, the blades being long enough and having sufficient spread to allow for any variation in the row. This machine will harvest 10 or 12 acres per day, and will require the labor of three or four men at the same time to put them in piles for loading. The price is $50. In bunching the beans for drawing in, the piles are made only large enough for one forkful each, usually from 10 to 15 feet apart, according to the growth of the plants. They are pitched with a common barley fork having long wooden tines, which are run under the bunch carefully, to avoid shelling. A one-horse hay-fork is often used to unload, as they are heavy to pitch by hand. One team will draw into the barn 8 or 10 acres a day, although it will not do to draw them in early in the day when there is dew. The rows of bunches when four rows of beans are put together will be ten feet apart, between which the team can be driven, and two rows on each side pitched on as the team passes along. The rows usually need turning over to dry the bottom, in doing which the two are brought nearer together to make more space for the team to pass. Mr. Bradford is also the inventor and manufacturer of the cultivator used. These machines have been long in use, and are believed to be as perfect as any to be found.

The threshing of beans may be done in the same way as that of wheat or other grain, and at about the same expense—by hand labor with a flail; or horses, by treading on a floor, or by machine. A bean threshing machine is in common use, manufactured at the Hall Threshing Machine Works in Rochester, N. Y. The machine is similar to the grain threshing machine, except that the cylinder has a covering instead of open bars, and runs at a low speed, and has round teeth, which will not split the beans. A fair crop of beans should yield from 20 to 30 bushels per acre; sometimes more, but often less when seasons are not favorable or when not well tended.

Preparing the Crop for Market.

When the crop is threshed and winnowed, it is ready to go to the dealer, who prepares and barrels the beans for market. If the crop were sent to the eastern market in the condition which the farmer with his common mill leaves them, very few lots would be marketable as of first quality. Much of the profit of bean growing depends on the skill of the dealer in fitting them for the eastern market. Our dealers ship none until they are fitted to go into the baking pan or soup pot in perfect order, for such only will pass as first quality, and command the highest price. Fixtures and mills are necessary to clean from them all dust and dirt; to separate and grade the different sizes; to screen out split beans and foreign seeds, and to separate all discolored beans. A mill in use for screening and sizing them, and separating splits, is manufactured by Whiteside, Barnett & Co., Brockport, N. Y., a cut of which is seen in

fig. 162. The company also manufactures a planter and a cultivator for beans, which are much in use. Their cleaning machine is indispensable, for no sample is of first quality until it passes through this operation.

Fig. 162.—*Machine for Screening and Separating Beans.*

After this, if any are discolored, they may be picked out by hand. To facilitate this work the beans are run upon a slow moving canvas, when boys or women are employed to pick out all imperfect ones as the beans pass over and fall into packages. Every season some careless farmer has damaged beans, and in wet seasons crops are sometimes injured even before harvesting. The expense of picking is 10 to 15 cents per bushel. The poor beans are sold for feed.

Domestic animals, excepting sheep, have not a natural relish for beans, but when educated to it, they often become fond of them. When boiled or steamed and mixed with meal or bran, hogs will fatten faster on the mixture than on corn or meal alone. They are worth as much as corn for feeding, and are worth more when cooked, for keeping hogs. No fodder is more valuable than bean straw. It is eaten with a relish by sheep, cattle or horses, and being a laxative food is very desirable to be fed with other dry fodder in winter. Its value per acre is nearly equal to cornstalks, though much less in bulk.

A New Invention.

It is well known that bean soup has become a common dish in the course at nearly all our public eating-houses, but it is rather unsightly when filled with the skins or hulls of the beans. To avoid this, and to make a finer article for this dish, and also to make a finer article for other modes of cookery, a process of skinning or hulling the bean has been in-

vented. Messrs. A. B. Raymond & Son, Brockport, N. Y., who are extensively engaged in the bean trade, have invented a machine (and applied for letters patent) which promises to be of value in preparing this valuable esculent much better for culinary use.

THE BEST ROSES AND THEIR CULTURE.

By Henry B. Ellwanger of the Mount Hope Nurseries, Rochester, N. Y.

AS WE ARE EACH YEAR ADDING NEW SORTS to our list of varieties, and are also making some occasional discoveries and improvements in propagation and cultivation, it follows that our selection of kinds and our treatment in culture will vary somewhat from year to year, as new varieties appear to take the places of old favorites, and we have knowledge of improved methods for the care of them. Reversing the order of our heading, we will first offer a few brief suggestions regarding the general culture suitable for hardy Roses, and afterwards, at some greater length consider what varieties can most satisfactorily be grown by the general public.

The first requisite is the selection and preparation of a suitable place for planting. This is very important, as all that follows depends upon the care used in this first step.

To begin with, then, choose the best place you have in the garden, a place where you can offer sufficient protection, by means of hedges or board fences, from bleak sweeping winds. When fences are used, their general ugliness can be most appropriately clothed by Roses themselves. A warm, sunny position is also requisite; if so situated that there is an exposure to the morning sun and the hot rays during the afternoon are in part or wholly shaded, all the better, but a certain amount of sunlight is as essential to a Rose's welfare as to our own, though many of us do not show our appreciation of the blessings of sunlight as gratefully as do our roses. Besides scattering them through our gardens, Roses may be made very effective planted in borders about our lawns, either individually or in groups, and also planted in beds on the lawn. When the latter is done we may, with great advantage, depart from the usual custom of growing the plants in bush form, and resort to what is termed the pegging-down system, as shown in fig. 163.

In this case the mode of procedure is quite simple. Having planted our Roses—for this purpose those on their own roots are preferable—we allow them to grow the first season in the usual way; the following autumn or spring, the short and weak shoots are entirely cut away, and the long ones carefully bent down and fastened to the ground by means of

pegs, or where more convenient, or preferred, they may be tied to stakes. Occasionally it happens that there is a hard stiff shoot which will crack or break near the ground, but if the bark on the underside continues

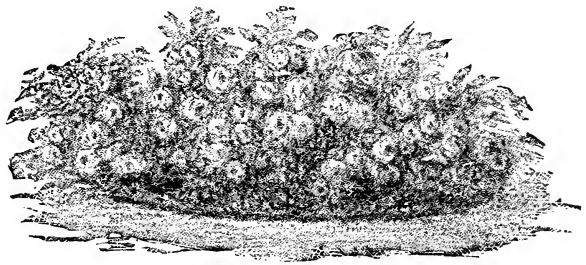

Fig. 163.—*Bed of Roses Pegged Down.*

whole this is generally of no consequence, as flowers will be produced, as well as though the shoot were uninjured.

Every year the pegging down must be repeated, the old shoots being cut away, and the new ones, which have come up during the summer, laid down in their place. The great advantage of this system over the ordinary practice of growing in bush form is the immense quantity of flowers produced, thus giving a magnificent appearance on the lawn, and affording all the cut flowers desired for household use.

Soil.—Roses will do well in any ordinary garden soil that is free from any standing water and well drained. Where there is too much clay, the soil can easily be made sufficiently friable by the application of wood and coal ashes, lime, stable manure, etc. Where, on the other hand, a soil is sandy or too light, we need to work in clay, muck, leaf mould, &c., to obtain sufficient body.

Pruning is best done during November or March, though to secure a good second crop of flowers in the autumn, it is also necessary to prune immediately after the first flowering is over with.

Manures.—In regard to this important portion of cultural operations, we would say there must be a generous application if we expect a generous yield of flowers. When Roses are planted in the spring, if the soil is ordinarily rich, it will be better not to dig in much manure about the roots, but rather apply it as a surface dressing. This will at once be nourishing, keep the roots cool, and prevent suffering from the drouths of summer. The following autumn, say in November, after the Roses have been planted, there should again be applied as a mulching a free application of stable manure, which may be dug in the next March. We find cow manure the best fertilizer, on the whole, that we have tried, though all kinds of stable manure are excellent, as are also bonedust, soot, guano, &c. For

full directions regarding this and kindred subjects we refer to the several excellent works on Roses.

With these few cultural hints, we proceed to a consideration of what are the best hardy Roses for general cultivation. We mean by this a list for beginners in Rose culture and the general public, naming those varieties which are most certain to succeed, and which will give the most generous return in profusion of flowers, fragrance and beauty. A perfect Rose therefore, for general cultivation should excel in the following particulars, and in the order named:

1. Beauty of color—as that which first attracts us to a Rose.
2. Beauty of form.
3. Fragrance—deprived of this, no Rose can be perfect.
4. Profusion and continuity of bloom.
5. Vigor and healthfulness of growth.

Let us consider at some greater length these several qualities essential to a perfect Rose. First—As regards color, we like something decided and pronounced, or else of great delicacy and softness and, withal, as durable as possible. The varieties differ very greatly in this respect. For example, Pius IX, a well-known old Rose of splendid habit, very seldom is seen of a clear color; the sun fades it almost immediately after the flower expands, and a dirty purplish shade of Rose is produced, anything but pleasing. La Reine, Giant of Battles, and others are likewise affected, though in less degree. Some, like Abel Grand and General Jacqueminot, are quite permanent, lasting oftentimes till the petals wilt and fall. Above all things, therefore, we want our colors pure and steadfast.

Form.—In form the Rose shows almost as much diversity as in color. We have globular, cup-shaped, imbricated and quartered Roses, besides many modifications of these forms. The globular Rose, as shown in Alfred Colomb, is the finest of them all, but the others are very pleasing in their variety, and we should not wish to be confined to the one type. The quartered or flat form is the most objectionable, though there are very many lovely Roses of quartered or flat shape, such as Caroline de Sansal, Baronne Prevost, &c., which are large, full, and even symmetrical. Shirley Hibberd in his excellent work on Roses, places form before color. This may be right in an exhibition box of Roses, but not as judged from our standpoint; however, it shows the very great importance of excellence in form, without which a Rose cannot stand very high in the scale.

Fragrance.—Did one ever think what we should lose were our Roses deprived of their sweet odors? Why, there would at once be a vacant throne, with no Rose to hold a queenly sceptre, and the strife of Dahlia, Camellia, Lily, Gladiolus and Rhododendron for supremacy would have no check, no limitation. Among all the delightful perfumes exhaled by the Lily, Heliotrope, Daphne, Jasminum, &c., none yield such delicate, sweet-scented odors as La France and Louis Van Houtte give us; they are alike supreme in beauty and fragrance.

PROFUSION AND CONTINUITY OF BLOOM.—This is also a very important feature. There is no doubt we have altogether too many kinds of so-called Hybrid Perpetuals, which though excelling in many other qualities, are lamentably deficient in this. They are perpetual in name only, and do not yield a sufficient number of flowers; they therefore should give place to true perpetual varieties.

VIGOR AND HEALTHFULNESS OF GROWTH.—Last and scarcely least, we look for a strong constitution. Varieties subject to mildew, like Caroline de Sansal, Prince Camille de Rohan, &c., have our commiseration as well as our regard; while weak or slow-growing varieties, like General Washington, Giant of Battles, La France, &c., we unfavorably contrast with the exuberant, healthful growth of such sorts as John Hopper, General Jacqueminot, Baronne Prevost, &c.

With these preliminary remarks, we submit a table, placing in order of merit the best hardy Roses for general cultivation. With the single exception of climbing Jules Margottin, we have not contemplated the admission of new varieties of the past four years. Some of them, no doubt, will be worthy a place in the list, but it takes time to thoroughly test a

Fig. 164.—*Alfred Colomb.*

Fig. 165.—*Madame Victor Verdier.*

Rose, and we wish to make this list as thoroughly reliable and nearly perfect as it is possible for such a list to be.

We have selected the following means of determining the comparative merits of different varieties: Taking five qualities named in the order of their importance, we assigned the following number of points to each: Color, 24; form, 22; fragrance, 20; freedom of bloom, 18; vigor and healthfulness of growth, 16; making a total of 100 points for a perfect Rose.

Where two or more varieties resemble one another, we have only re-

tained the superior sort as a contestant; thus Ferdinand de Lesseps and Maurice Bernardin are thrown out as being similar, but inferior, to Charles Lefebvre.

This gives a list, therefore, of quite distinct sorts; those which are nearest alike being Alfred Colomb (fig. 164) and Mme. Victor Verdier (fig. 165) at the head, and they are sufficiently dissimilar to make both essential, even in a very limited collection.

We have given the shade of color in case any one should desire to select from this list with reference to having only a few sorts quite distinct from each other in tint; but as already mentioned, Roses vary almost as much in form as in color, and we may have two kinds with precisely the same shade, yet strongly differing in every other respect and therefore entirely distinct. The list runs as follows:

THIRTY OF THE BEST HARDY ROSES FOR GENERAL CULTIVATION.	*Color.*	*Form.*	*Fragrance.*	*Freedom and continuity of bloom.*	*Vigor & healthfulness of growth.*	*Total.*
Maximum number of points,.....	24	22	20	18	16	100
1. Alfred Colomb, crimson,..	24	22	19	14	13	92
2. Mme. Victor Verdier, crimson,.....	24	21	19	14	13	90
3. John Hopper, carmine rose,.....	24	20	14	16	16	90
4. General Jacqueminot, velvet crimson, ...	24	16	17	17	16	90
5. Countess Cecile de Chabrillant, pink, ...	23	22	17	13	14	89
6. Abel Grand, glossy rose, ...	23	20	15	16	15	89
7. Marie Baumann, carmine crimson,.....	24	22	18	14	10	88
8. Charles Lefebvre, deep crimson,..... ...	24	21	16	14	13	88
9. Francois Michelon, carmine rose, ...	24	21	15	15	13	88
10. La France, silvery rose, ...	24	22	20	18	3	87
11. Marguerite de St. Amande, bright rose,...	24	20	12	16	15	87
12. Climbing Jules Margottin, carmine pink,..	24	19	14	14	16	87
13. Duke of Edinburgh, bright crimson, ...	24	17	15	15	15	86
14. Baronne Prevost, rose,...	23	14	17	16	16	86
15. Louis Van Houtte, maroon, ...	24	21	20	14	6	85
16. Paul Neyron, rose,.....	22	19	13	15	16	85
17. Anne de Diesbach, carmine,.....	24	16	12	14	15	81
18. Mme. Boll, carmine rose,.....	24	21	12	8	15	80
19. Prince Camille de Rohan, dark crimson,...	24	18	14	12	10	78
20. Countess of Oxford, carmine red, ...	24	22	4	14	13	77
21. Caroline de Sansal, rosy flesh, ...	23	15	12	14	13	77
22. Mme. Alfred de Rougemont, white,.....	20	16	14	18	9	77
23. Peach Blossom, pink, ...	22	16	10	12	13	73
24. Coquette des Blanches, white, ...	23	10	8	18	12	71
25. General Washington, reddish crimson, ...	20	18	4	17	8	67
26. Marquise de Castellane, carmine rose,.....	24	19	2	9	10	64
27. Baroness Rothschild, silvery pink, ...	24	21	2	12	4	63
28. La Reine, rose, ...	15	12	10	12	14	63
29. Etienne Levet, carmine red,.....	24	20	2	10	6	62
30. Mdlle. Eugenie Verdier, silver rose,.....	24	20	2	8	7	61

A list of this kind would not be complete without mention of some summer Roses. Though blossoming but once a year, some of them, no-

tably the mosses, are so beautiful as to be essential to a Rose garden of any size or pretentions. We name the following as the best: For climbers, Bennett's Seedling, Baltimore Belle and Queen of the Prairies. We have also a new race of climbing Hybrid Perpetuals, which promise to be valuable, but are not fully proved. Among non-climbers the most desirable are Persian Yellow, Mme. Hardy, Mme. Plantier (fig. 166), and the following Moss Roses—Crested, Common Moss, Countess of Murinais and Salet; the latter, though less beautiful than the others, blooms freely in autumn, and would be quite valuable for that quality alone.

The selection or mode of electing varieties to a position in the above list is of course, arbitrarily done, but it has been carefully and we may say

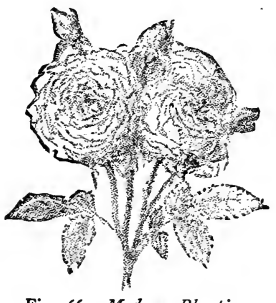

Fig. 166.—*Madame Plantier.*

Fig. 167.—*La France.*

laboriously compiled; and though judges would differ more or less in the relative estimation of the different qualities which go to make up a perfect Rose, and the number of points which should be variously assigned, we nevertheless think it will be a serviceable guide. As will be seen from the table, we have no Rose which may be called perfect; our choicest sorts, excelling in some qualities, fall short in others; thus Alfred Colomb, which heads the list with 92 points out of a possible 100, is less fragrant than La France, (fig. 167,) more coy of its bloom than Coquette des Blanches, and does not have the lusty vigor of growth possessed by Baronne Prevost, but for the five qualities combined, no sort altogether equals it. Mme. Victor Verdier is a sister variety of nearly equal worth. Honest John Hopper, always steadfast aad true, comes third. Victor Verdier bears him much resemblance in color and general appearance, but has neither the fragrance nor vigor of constitution to be counted a rival.

General Jacqueminot, notwithstanding a lack of fullness and rotund form, is now one of our oldest, most generally known, and also best Roses for general cultivation. Clad in his rich crimson livery, he is still prepared to lead the van.

Countess Cecile de Chabrillant, (fig. 168,) possibly from the length of name, is a variety too much neglected and lost sight of. The flowers are not large but most beautiful, and are models of symmetry and grace. Let no one overlook her claims.

Abel Grand is another neglected, or

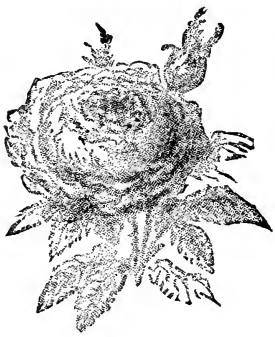

Fig. 168.—*Countess Cecile Chabrillant.*

Fig. 169.—*Marie Baumann.*

at least not well known, variety of the highest excellence, especially valuable in the fall of the year, when compeers otherwise equally meritorious are devoid of even semblance of bloom.

Marie Baumann! How difficult to depict her charms! Original and exquisite in all her features, she claims a choice position in every garden. There is no more beautiful variety than this in the entire list—fig. 169.

Charles Lefebvre (fig. 170) is an improved Jacqueminot in form and possibly color, though somewhat inferior in the other qualities. Only within a year or two have we in this country learned to appreciate this noble Rose.

Fig. 170.—*Charles Lefebvre.*

Fig. 171.—*Francois Michelon.*

Francois Michelon, (fig. 171,) a comparatively new sort, is rapidly gaining favor. It is a seedling from La Reine, bearing some resemblance to that well-known sort, but decidedly superior in color and form. Follow-

ing this is La France, the sweetest of all Roses; compelled to choose one variety, this should be ours. It is not only the most fragrant, but, with the exception of those Hybrid Noisettes, Madame Alfred de Rougemont and Coquette des Blanches, will yield more flowers during the year than any other sort named. It flowers so profusely that its growth is checked, every eye sending forth a flower shoot; it is, alas, not very hardy, being the most tender on the list, but though the tops are killed, it will start out again in the spring from the roots, the same as the Hybrid Noisettes.

Marguerite de St. Amande is a worthy companion of Abel Grand, furnishing a generous supply of autumn flowers.

Climbing Jules Margottin, besides being of more vigorous growth, seems, if anything, more beautiful than the old sort, from which it is a sport. It is well worth growing for its buds alone.

Duke of Edinburg is a bright colored Jacqueminot, which is saying all that is necessary.

Baronne Prevost, one of the best of the flat type, is a worthy companion of General Jacqueminot, and a model of vigor and health. It is the oldest variety known, having been sent out in 1842.

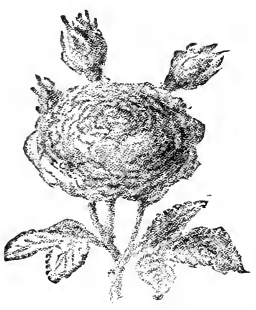

Fig. 172.—*Louis Van Houtte.*

Fig. 173.—*Anne de Diesbach.*

Louis Van Houtte, like La France, is but half hardy, and is also worthy of extra care. No other sort so nearly approaches La France in fragrance, and when planted in a bed together, the deep velvety maroon of the one contrasts most admirably with the delicate silvery rose of the other. It is shown in fig. 172.

Paul Neyron is the largest variety known, and although its size detracts from our notions of a refined Rose it is nevertheless a noble sort for any garden.

Anne de Diesbach, (fig. 173,) a true carmine, has its rivals of the same

shade, but her pure, lovely color has never yet been equalled by any of them.

Madame Boll is almost worth growing for its large lustrous foliage, but the blooms correspond in size and quality, only are too seldom seen after June blossoming is over.

Prince Camille de Rohan is a superb, very dark sort, quite well known.

Countess of Oxford (a magnificent carmine red, of the Victor Verdier type,) like Francois Michelon, is rapidly becoming popular, its chief defect being a want of fragrance, which it lacks in common with all the Victor Verdier race, such as Captain Christy, Etienne Levet, Lyonnais, Madame George Schwartz, Madame Marie Finger, Mdlle. Eugenie Verdier, President Thiers, &c.

Caroline de Sansal is a well-known, justly popular sort.

Madame Alfred de Rougemont and Coquette des Blanches are, all things considered, the best white perpetuals we have.

Peach Blossom, a comparatively new sort, seems to improve each year, and gives a new shade of color very desirable.

General Washington is one of the most widely disseminated varieties in this country, but it does not reach the maximum number of points in any quality. In color it is sometimes grand, but generally it has somewhat of a faded appearance, being quickly affected by the sun, and seldom is seen truly pure. The same may be said respecting form, sometimes superb, but generally seen with some defect, either a green centre, or irregular and not symmetrical. Of fragrance it is almost entirely devoid. It ranks very high as a free bloomer, but, like La France, this is at the expense of growth.

Marquise de Castellane does not always open well, but gives many large carmine-rose blooms of globular shape that are truly superb.

Baroness Rothschild has exquisite cup-shaped flowers entirely distinct from all others. It is unfortunately of stubby, short-jointed growth, and can only be propagated by budding or grafting. This will always tend to make it somewhat scarce.

La Reine is another well-known old Rose which we cannot yet afford to discard, though now surpassed by so many finer varieties.

Etienne Levet, another of the newer sorts, somewhat resembling Countess of Oxford, is rapidly finding favor, and had it but fragrance, would be assigned a higher position.

Mdlle. Eugenie Verdier, the last on the list, is certainly one of the most delicately beautiful colored varieties we have, but here again the lack of fragrance deprives it of a higher position.

MY EXPERIENCE WITH MARKET LAMBS.

By Henry Stewart, Bergen County, N. J.

IT WAS SEVERAL YEARS AGO that on a Saturday evening a large drove of sheep was stopped at my front gate, and the owner asked for pasture for it until Monday morning. He was willing to pay one cent per head per night, which, as there were about 1,000 in the drove, was a tempting offer. I bargained with the man to give him the pasture for the pick of seven ewes from the flock. On Monday morning I picked out the seven ewes, and was induced to make a purchase of 48 more, for the sum of $120. This transaction finally brought me into the business of raising early lambs for market. I had a flock of pure Cotswolds and some young ram lambs. It was in September, and a poor field was ready to be occupied. The ewes were turned into the field with three sturdy, well grown young Cotswold rams. The ewes were deep and long bodied Ohio native sheep, having a mixture of Merino and South-Down blood, as shown by the short wool and partly smutty faces and legs. I determined to raise some lambs, and set about it. The flock ran in the field until the winter, when it was brought into a yard in which an open shed was built containing a feed-rack and a raised floor. The shed was 100 feet long, made of rough boards, 10 feet wide, 7 feet high at the back and 4 feet at the front, which was made with sliding doors, so that it could be half opened or wholly shut. A passage was made in the rear of the feed-rack, having several double doors. The shed (fig. 174) ran partly around three sides of a yard 100 by 44 feet; was fenced with boards, and was kept well littered with straw. A feed-rack was placed in the centre of the yard, into which oat straw and corn fodder chopped into 6-inch lengths was kept for the ewes to pick over. The flock was kept in this yard and shed during winter and spring, until the grass was up, being driven out twice a day to water in the large barnyard adjoining. The fodder rack running around the shed was made of strips 1½ inches wide and one inch thick arranged so as to slope backwards 2 or 3 inches at the top, to keep the hay seed from falling

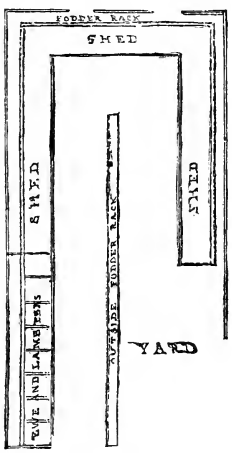

Fig. 174.—*Plan of Sheds.*

in the wool, and the strips were separated by spaces of 3 inches, to prevent the sheep thrusting their heads between the bars and rubbing the wool from their necks. Previous experience had taught me that unless the rack is made with a view to these contingencies, there is not only damage to the fleece, but a sheep might be occasionally fastened by the head in the rack, and become strangled. The form of the rack is shown in section at fig. 175—*a*, the sloping back; *b*, the front bars; *c*, the feed

Fig. 175.—*Section of Fodder Rack.*

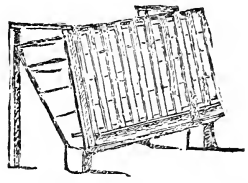

Fig. 176.—*View of Fodder Rack.*

trough. Fig. 176 is a view of the rack. The sloping boards at the rear served to keep the hay to the front of the rack, and also to carry the grain and meal down into the feed trough below. The only objection to this arrangement was that when the ewes were eating hay they would put their feet in the feed trough, but I have never yet found any feeding arrangement free from some objection, so long as animals cannot be taught good manners.

The section of the shed is given at fig. 177, showing the passage behind the trough and feeding floor. The floor of the shed was raised a foot above the level of the yard, to permit of the gradual accumulation of litter and manure, which in the spring was nearly two feet deep all over the yard.

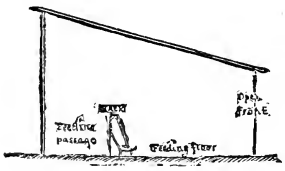

Fig. 177.—*Section of Shed.*

The feeding of the ewes before lambing was as follows: In the morning clover hay in the shed; at noon one pint each of mixed grain, corn, oats and buckwheat; occasionally this was changed to a similar quantity of linseed oil-cake meal and rye bran mixed in equal parts. Corn fodder or straw was given in the yard at noon; at night the rack was filled with clover hay.

The lambs began to come in February. Each ewe was closely watched, and as soon as signs of lambing were perceived she was placed in a small pen, of which there were eight, adjoining the feed shed and shown in the diagram (fig. 174.) These could be kept dark if needed and were divided by boarding 4 feet high. They were made warm by a small stove set up in the end of the passage. When the lambs were strong

they were turned out with their dams into the yard, and generally found the sunny side, where they gambolled and played.

As soon as the lamb was dropped the ewe was given about two quarts of warm oatmeal gruel, with a tablespoonful of sugar in it. The sugar tempted some to drink which at first cared little for it. The lamb was held up to the teats and helped to suck once or twice, if necessary, which was seldom. The ewes were fed more liberally after lambing, and selected ones that needed it were given an extra mess out of a shallow pan held for them.

In May some of the lambs were ready for sale. The first four sent down, in a box made of battens, to the New-York market brought me back a check for $40; and since then I have sold many as early as April, at 25 to 35 cents a pound, live weight. My sales the first year ran from $10, the first price, down to $4.50, when I stopped sending to New-York, and sold what I had left at home for $3.50, to the local butcher.

Occasionally a lamb would need attention to remove the gummy excrement which otherwise closed the gut, and would have caused death. For the first few days after birth, this should not be neglected. Having these warm pens, there were no chilled lambs, and the only lambs lost were two that crawled under the feed rack in the shed, and could not return. To prevent such an accident, every hole or space large enough should be carefully closed. The low roof of the shed gave ample protection against storms, and during very cold rain storms the sliding doors could be closed on the side where the rain beat in. Then the double doors on the rear of the shed are opened, to give plenty of ventilation.

As soon as the grass was long enough, the flock was turned out in the day, after having been fed with their allowance of grain or meal in the morning; and in the evening they had a similar allowance, which was half a bushel for the 55 head at each feed. This gave about one pound a day, but some ewes with twin lambs received an extra allowance, given in a shallow dish, as before mentioned. Constant mingling with the sheep had made them tame and easily handled, and this was found a great convenience in giving the required attention.

After experience led me to choose South-Down rams for the sires of the lambs, as the black-faced and dark-legged lambs are better liked and are more solid for the size than the Cotswold. I found Leicester ewes were an entire failure; several ewes died in lambing, and several lambs were lost in birth or pined away afterwards. Pure Cotswolds are too scrawny, and pure natives are too leggy to be desired in the market. After several years' trials of several different breeds, I consider the South-Down or the Hampshire-Down the best breeds for market lambs. By earlier coupling of the ewes, I have had lambs at Christmas, and have had them in market at Easter, but there is more trouble in looking after such very early lambs than is compensated by the price received. Rather than sell lambs before May, I would keep them and feed them to a greater

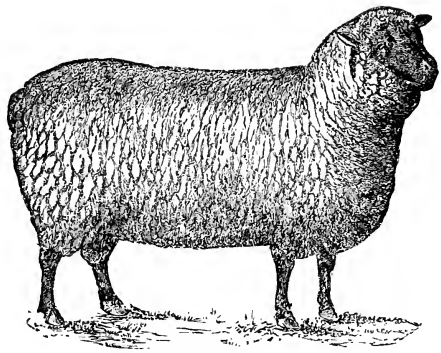

Fig. 178.—*Shropshire Ram—a Model Sire for Market Lambs.*

weight, because a thin lamb, although early, will not sell as readily or profitably as a large, heavy one, two or three weeks later.

After the lambs had been all disposed of, the ewes were fed for market, and before September had returned again, they had been sold to the butcher, having each given me a fleece and nearly every one a lamb, and realized an average advance of nearly 50 per cent. on their first cost. I have repeated this operation several times with about the same result, which is a profit of 150 per cent. on the investment, and a goodly lot of manure, which pays for all the trouble.

Fig. 179.—*Lamb.*

The points to be considered and prepared for are:

1. The selection of mature, well-grown ewes, with deep flanks, long bodies, and backs as broad as may be. A ewe with a gothic-arched back should be despised and rejected; she will be neither a milker, a good mother nor a feeder.

2. The selection of a good ram, a South-Down or a Hampshire-Down preferably, or a Cotswold of square, compact form, and short legs and deep brisket. One with brown legs and face would probably mark his lambs in the same way, and this would be an advantage.

3. The keeping of the ewes in constant good condition by regular and liberal feeding while breeding, and in feeding after lambing some sort of food that will maintain a copious flow of rich milk. It is better to feed the lamb through the ewe than to disorder it by giving food that is unnatural and unfitted for it.

4. To provide an airy, open shed, with a dry, capacious yard, and to avoid keeping the ewes too warm.

5. To provide separate pens for the ewes when lambing, and to keep them warm in cold weather by artificial heat if necessary.

6. To nourish the ewe with a warm drink after the lamb is dropped. A weakly ewe may be brought up greatly by means of a teaspoonful of gin in a pint of warm gruel, poured down with a drenching horn.

7. To see that the lamb is not injured by obstruction of the bowels, or from any inability to reach the teat and suck, or from a closed teat, when young and weak. The lamb should have a good meal within three hours after birth.

8. To suffer no check to the growth of the lamb, and to avoid stinting it by well meant but injudicious over-feeding with cow's milk or with solid food. If cow's milk is given, it should be from a fresh cow, and never in larger quantities than a quarter of a pint at one time. If bran or meal is fed, half an ounce to a lamb is enough to begin on, and an ounce is enough for a square meal. The danger lies in producing indigestion, scours, or costiveness, either of which will spoil the lamb, so far as profit as a market lamb goes.

9. To pack the lambs in light but comfortable boxes, or crates, when sent by express, which is best when not more than 100 miles from market.

10. To watch the ewe when the lamb is taken away, and to milk her if need be until the milk is dried up. Garget can be prevented with the greatest ease, but is difficult to cure without loss of the udder.

11. To begin to feed the ewe as soon as she is dried off, and get her to market forthwith.

12. To buy only thrifty ewes, and to buy them cheap, but not to buy them because they are low-priced, if they are not suitable. The best breeders and mothers will pay to keep over for several years sometimes. One ewe raised for me nine pairs of lambs in nine years, and died and was buried at the ripe age of thirteen years.

GOOD AND BAD PRUNING.

IN RIDING THROUGH THE COUNTRY, we often see young orchard trees injured in growth and deformed in shape by bad pruning. During the early part of the past season the owner of a fine orchard just coming into bearing, allowed it to become nearly destroyed by bad treatment. The man whom he employed seemed to think that the more he cut away the better. The trees were in full leaf, and had just begun a vigorous growth. At least one-half the foliage on the tops was hewed off. As an inevitable consequence, a serious and nearly fatal check was given to the trees.

In order to exhibit distinctly what we have so often urged on former occasions, we give representations of two trees, the one pruned early in spring or while the buds are yet dormant, and the other after the opening of the leaves. After one season's growth, the former appears like fig. 180; the latter as shown in fig. 181; the first with shoots 2 or 3 feet long; the latter with a growth of scarcely as many inches. This pruning or cutting back of the shoots is not of course usually performed on trees already set and established, but only at the time of trans-

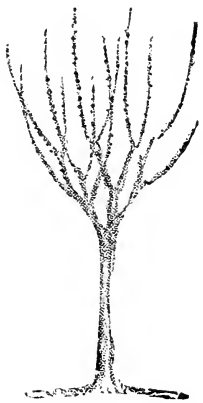

Fig. 180.—*Spring Pruned.*

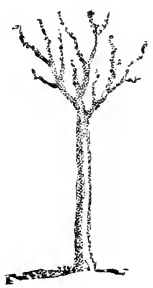

Fig. 181.—*Summer Pruned.*

a *b*

Fig. 182.

planting, for the purpose of rendering the top lighter at that time, the new shoots being thrown out the same summer. This result and contrast will not be exhibited the same on all kinds of trees, some of which are more checked in growth by early summer pruning than others. The cherry suffers most; the peach least.

The contrast is strongly shown on such young trees as have been budded the previous summer, and are cut back in spring to near the inserted bud. If the cutting back is done before growth commences, the appearance of the young tree by autumn will be as in *a*, fig. 182. If, on the contrary, the work is neglected till the leaves have opened on the stock, the bud, if it grows at all, will make a growth about like that shown in *b*, fig. 182.

A serious error is committed in pruning orchards when they do not need it. It sometimes happens that the tops of the trees become too thick, and a light and even thinning of the dense branches proves a benefit. This should always be done *from the outside*, and never at the centre of the head. Figs. 183 and 184 exhibit two trees, which have been treated by these two opposite modes. In fig. 183 it will be seen that the branches are not dense on the outside, but they have been trimmed enough to let in the light. Fig. 184 shows the too frequent error of thinning up from

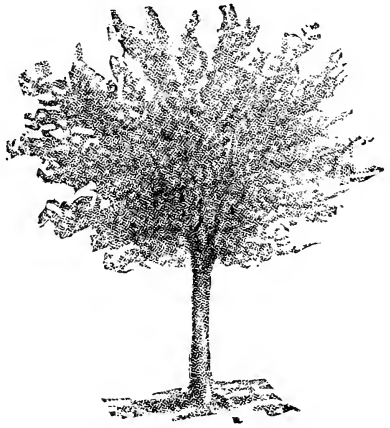

Fig. 183.—*Well Pruned Tree.*

below, leaving a dense mass of foliage at the outside; and in extreme cases the tree is in as bad a shape as is shown in fig. 185. When such trees become old they are perfect specimens of deformity.

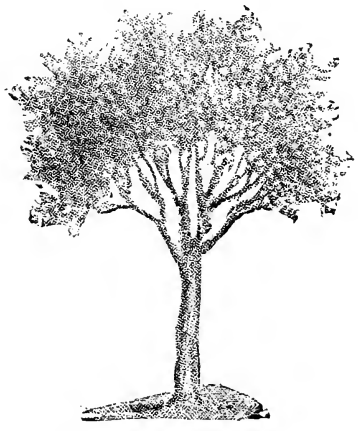

Fig. 184.—*Badly Pruned Tree.*

It should always be borne distinctly in mind, that if the small needless or supernumerary shoots are rubbed off when just starting to grow, very little pruning will be afterwards needed, except to

Fig. 185.

lighten the top in transplanting, and for letting in the sunlight from the outside when the top becomes too dense in after years.

A WESTERN CORN CRIB.

By Joshua Constable, Goodland, Indiana.

SIZE OF BUILDING, &c.—This corn crib building, as shown in the accompanying drawings, is 40 feet long, by 26 feet wide, with 18 feet uprights at the eaves, and a total height of 28 feet 7 inches from the ground to the ridge. In the centre of the building there is an alley or drive-way 40 feet long, by 10 feet wide; and on each side thereof a crib 40 feet long, by 8 feet wide, and about 19 feet in average height. Each crib will hold about 2,500 bushels, or the two together about 5,000 bushels of corn in the ear.

The centre alley-way is divided into three floors or stories in height; the lower or ground floor is 40 feet long, by 10 feet wide, and 10 feet 7 inches high; the middle floor is the same length and width, and 7 feet 6 inches high; and the upper floor also 40 feet long, by 10 feet wide, and 6 feet 6 inches high to under side of ridge. The ground floor of the alley or drive-way is enclosed at each end, by double sliding doors, with glazed windows therein; the middle floor has one sliding door, and two windows at each end, and the upper floor one window at each end, and a glazed skylight on the roof ventilator; so that the whole building is well enclosed, lighted and ventilated. The doors at the ends of the cribs at *d d*, figs. 186 and 187, are for feeding the corn to the horses, cattle, &c. Those on the sides of the cribs at *c c*, figs. 186 and 188, for introducing the shafting or tumbling rods from the power to the sheller, and for feeding; and the openings in the partitions, between the alley-way and the cribs, at *B B*, fig. 186, for shoveling the corn into the shelling machine.

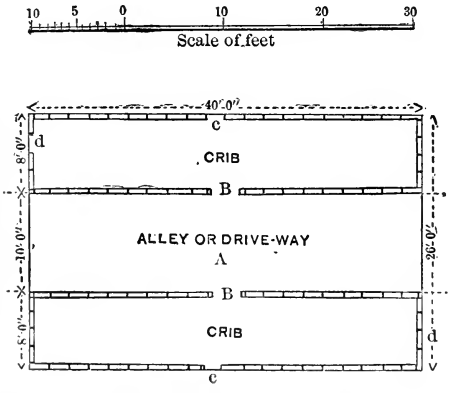

Fig. 186.—*Ground Plan*—A, *Position of Sheller;* B B, *Doors for Feeding Sheller;* d d, *Doors for Feeding to Horses, &c.;* c c, *Doors for Shafting and Feeding.*

FILLING THE CRIBS.—The corn, as picked in the field, is brought on to the ground floor of the alley or drive-way, and thrown out of the wagons into the cribs on each side, through continuous openings, one foot ten inches square, between the uprights, just under the middle floor at *e e*, figs. 187 and 190; 2,800 bushels may thus be thrown into the cribs through these openings; then about 700 bushels can be thrown from the wagons through the four outside upper doors, on each side of the cribs (see fig. 188); and the remaining 1,500 bushels must be thrown on to the middle floor of the alley-way, through the doors at each end, and up through the well-hole in the centre of the middle floor at *h*, fig. 190; and then these 1,500 bushels must be thrown over into the cribs through continuous openings just under the upper floor at *e e e e*, figs. 187 and 190.

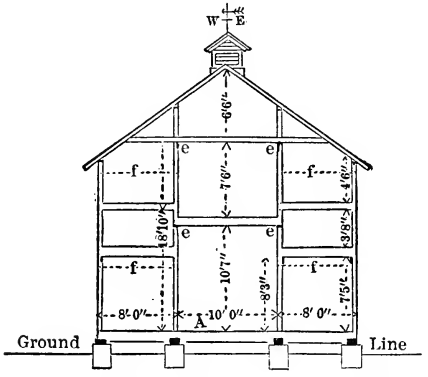

Fig. 187.—*Transverse Section*—A, *Position of Sheller*—e e e e, *Openings for Filling Cribs*; f f f f, *Iron Wire Ties.*

POSITION OF THE SHELLING MACHINE.—The shelling machine is placed on the ground floor of the centre alley or driveway, at *A*, figs. 186, 187 and 190. The power, which is worked by eight horses, is placed outside, on either side of the building, for which a space of about 50 feet distance therefrom is required. The rods or shafting from the power to the sheller pass through the middle of the cribs, having in one of the cribs a moveable wooden trunk, 4 by 6 inches inside area, to enclose the rod or shaft, so as to permit the rod being run inside the trunk to the sheller when the crib is full of corn.

The corn is shoveled from the cribs into the hopper of the sheller through the openings, 2 feet 10 inches wide, by 7 feet high, in the partitions between the cribs and the alley-way, at *B B*, figs. 186 and 190. The corn as shelled is carried by the machine up the elevator on to the middle floor of the alley-way; which will hold about 1,500 bushels, (the sides and ends being boarded up to retain the corn,) which is a moderate day's work for the shelling machine. When the corn in one crib is shelled out, the power must be removed to the other side of the building, to shell out the corn in the other crib.

HAULING TO MARKET.—The shelled corn thus placed on the middle-floor of the alley-way, runs down as required, through four shoots, about

6 by 3 inches inside area, fixed about 10 feet apart in the middle floor, into empty wagons standing below, on the ground floor of the alley-way;

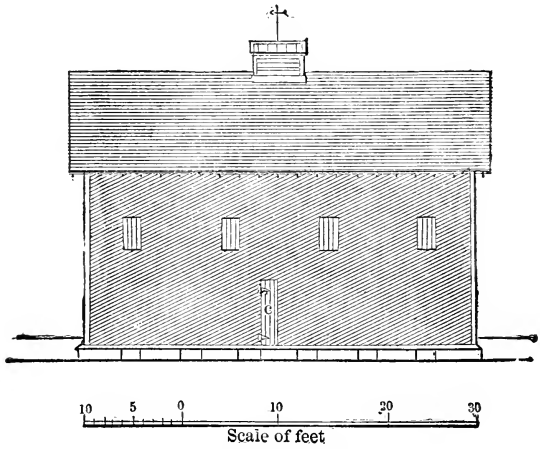

Fig. 188.—*Side Elevation.*

and thus the farmer can, with his own teams, haul his corn leisurely to market, without the expense of hiring or borrowing teams of his neighbors.

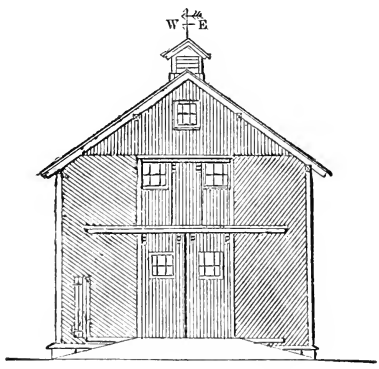

Fig. 189.—*End Elevation.*

GENERAL STORAGE.—The upper floor of the alley-way, would store 1,000 bushels of wheat or oats, seed corn, &c., or be available for other

storage; the middle floor serves as a corn granary, and thus saves the cost of a separate building. Two loads of hay, &c., could be sheltered in wet weather on the ground floor alley-way, till placed in barn or stack; and both the ground and middle floors would be available for wheat, oats, &c,, and other storage purposes, when not required in husking and

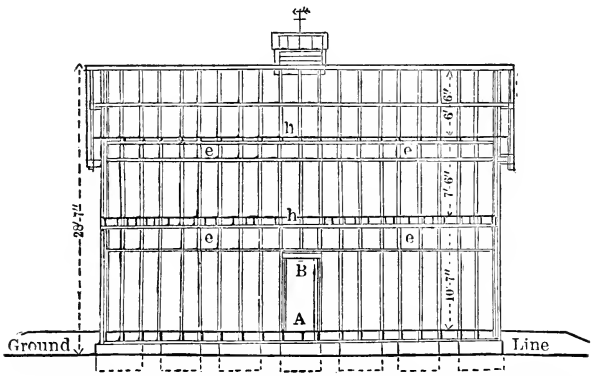

Fig. 190.—*Longitudinal Section (through Alley or Drive-way).*—A, *Position of Sheller in Alleyway*; B, *Opening to Cribs*; e e e e, *Continuous Openings for Filling Cribs*; h h, *Well-holes through Middle and Upper Floor.*

shelling; besides, if the crop of corn should be above the average, the last corn husked, to the extent of 1,000 to 2,000 bushels, may be stored temporarily on the ground and middle floors, thus making the building, in times of emergency, a crib for 7,000 bushels of corn in the ear.

SPECIFICATIONS.

FOUNDATION PIERS.—There are twenty-eight foundation piers. Twenty are 4 feet 2 inches long, and about 2 feet thick. The eight corner piers are 4 feet 7 inches long, with 1 foot return to each, and 2 feet thick; all built of cobble-stone masonry laid in mortar; the piers show 1 foot above the ground, and are put at a sufficient depth below, to insure a solid foundation; and have ventilator air openings, 1 foot 10 inches wide between each pier.

SILLS, PLATES AND UPRIGHTS.—The ground sills are 4 by 8 inches, laid flatwise on the foundation piers, and bolted together at the splices and corners; plates, 2 by 6. Those at the eaves, and under the middle floor joists of the alley-way are in two thicknesses, equal to 4 by 6 in. Upright studs are 2 by 6, spaced at the sides of the building 1 foot 10 inches apart, and at the ends 1 foot 7½ inches apart. At the eight corners of the building the upright studs are double, and those for the partitions between the alley-way and cribs are in two heights.

JOISTS.—The joists for the crib floors are 2 by 12 inches, for ground and middle floors of alley-way, 2 by 10, for upper floor and ties to the rafters, 2 by 6; those for the middle floor are spaced 1 foot 2 inches apart, all others 1 foot 10 inches apart, and all securely spiked and nailed to the sills, plates, uprights and rafters; one tier of herring-bone studding or braces 2 by 2 in. are fixed between the joists of the middle floor.

RAFTERS.—The rafters are 2 by 4 inches, spaced 1 foot 10 inches apart, outside gable

rafters 2 by 6, the plates and ridge of gables outside, are increased to show 6 by 6.

HORIZONTAL TIES, POSTS, &c.—The horizontal ties, to which the close boarding of the gables is fixed, and for the door and window posts, lintels, &c., are 2 by 6 in.; the lintels, over the two openings in the partition between the cribs and alley-way at *B B B B*, figs. 186 and 190, are in three thicknesses spiked together, equal to 6 by 6.

TIES TO CRIBS.—The lower ties are 1 by 12 inches, fixed 7 feet 4 inches above the floor; the upper ties 1 by 8, fixed at 3 feet 8 inches between the two tiers of ties; all strongly nailed to the sides of each upright 1 foot 10 inches apart. The lower tiers of ties rest at each end on oak strips, 1 by 4 inches, let flush into the uprights.

ROOF SHINGLING, STRIPS, &c.—The roof is covered with sawed pine shingles, fixed to rough strips or battens 1 by 4 inches, nailed on the backs of the rafters 2 inches apart, for air. The ridge boards are 1 by 6 in. dressed.

FLOORING.—The flooring of the cribs is of one inch rough boarding; ground floor of the alley or drive-way of 2-inch plank in 8-inch widths; the middle and upper floors of the alley-way are of one-inch dressed and matched common flooring, in 5¼ inch widths. A well-hole 4 feet 2 inches wide and 10 feet long is formed in the centre of the middle and upper floors of the alley-way, at *h h*, fig. 190, and two movable joists and the flooring fitted to the well-hole on the middle floor, to be used when shelling, &c.

STRIPS TO THE CRIBS.—The outside of the cribs is covered with dressed strips 1 by 4 inches, fixed 1¼ inches apart for air, nailed with two nails to each upright, at an angle of about 30 degrees, so as to brace the building and allow the rain to run off quickly. The inside, between the cribs and the alley-way is covered (except where lined on the middle and upper floors) with 1 by 4 in. rough strips fixed horizontally, with 1¼ inch air openings between each two strips.

MOVABLE SHUTTERS.—The continuous openings just under the middle floor of the alley-way, where the corn is thrown into the cribs, at *e e e e*, figs. 187 and 190, have movable open shutters, ten in number, 8 feet long, by 1 foot 8 inches high, made of 1 by 4 inch rough strips, with 1¼ inch air openings between each, and 1 by 4 in. oak ledges at the back, one ledge to come between and close to each upright. The ledges are 4 inches longer than the width of the shutters, so as to pass and drop behind the fixed oak strips at top and bottom, and be thus secured in position.

BOARDING AT GABLES.—The upper part of the gable ends of the building is close-boarded with one-inch dressed and matched common flooring in 5¼-inch widths.

OAK FILLETS.—Oak fillets 2 by 2 inches are spiked on the outer edge of the two outside ground sills, and to the two plates under the middle floor of the alley-way, to prevent the feet of the uprights from spreading outwards, and also to the posts of the two openings in the partitions between the cribs and alley-way, at *B B B*, figs. 186 and 190, to retain 2 by 4 in. battens, to keep the corn in the cribs; and oak fillets 1 by 2 to the posts of the four lower door-ways, to retain 1 by 4 battens to keep the corn in the cribs: and 1 by 2 oak fillets to the ten windows.

OAK STRIPS.—The strips at the top and bottom of the continuous openings through which the corn is thrown into the cribs, at *e e e e*, figs. 187 and 190, and under the ends of the lower tier of ties to the cribs, are of oak; those under the ends of the joists of the middle floor of the alley-way are 1 by 6 inches, and all the others 1 by 4. The ledges to the ten movable open shutters, and to the twelve small doors to the cribs, are also of oak 1 by 4.

CANT BOARDS.—The cant boards, to protect the tops of the stone piers, are 1 by 8 inches, dressed and fixed to 2-inch blocks nailed to the ground sills.

ANGLE STAFFS.—The angle staffs are 1 by 6 inches, dressed and fixed to the corners of the building, nailed on over the strips.

LINING.—The side walls and ends of the middle floor for 3½ feet high, and also on the upper floor of the alley-way for 2 feet high, are lined or boarded with one-inch dressed and matched common flooring in 5¼ inch widths, to retain the corn, wheat, oats, &c.

VENTILATOR.—The roof ventilator has corner posts 4 by 4 inches, bottom plates 2 by 6, top plates 2 by 4, ventilator boards 1 by 8, all dressed; and covered with two glazed skylights 2¼ by 6 feet, and 2 inches thick.

LARGE SLIDING DOORS.—The large sliding doors, each 5 feet 1 inch by 10 feet 8 inches, at the ends of the ground floor of the alley or drive-way, are made of one-inch dressed and matched common flooring, in 5¼-inch widths, nailed together in two thicknesses, outside face vertical, inside diagonal; having a glazed sash 1 foot 7½ inches square, and 1⅜ inches thick, in each door. These doors are hung with strong iron suspending hinges and rolling wheels, fixed with bolts and nuts. The wheels run on an iron carriage bar 2½ by ⅜ of an inch, fixed with screws to a piece of oak 2 by 3 in., and protected at the top from snow, &c., by a hood of one-inch dressed boards top and front, and a one-inch dressed trough to guide the bottoms of the doors. The doors are fastened with an iron cross-bar and hasps and staples, and an iron ring for opening. The sashes are hung at the top with 3-inch iron butt hinges, and fastened at the bottom with a 3-inch iron hook and eye.

SMALL SLIDING DOORS.—The two sliding doors, one at each end of the middle floor of the alley-way, are 3 feet 2 inches wide, by 6 feet 6 inches high, and are made and hung the same as described in the preceeding paragraph, except that there are no sashes in these doors.

SMALL DOORS IN CRIBS.—The twelve small doors to the cribs are made of dressed strips 1 by 4 inches, with 1¼ inch air spaces, and oak ledges 1 by 4 at the back; the four lower doors are hung with 6-inch T hinges, and fastened by an iron cross-bar with hasps and staples.

SLATS.—The movable slats or battens (to stop the corn) at the two openings between the cribs and alley-way, at *B B B*, figs. 186 and 190, are 2 by 4 inches, with 1¼-inch air openings; and those at the twelve outside doors of the cribs are 1 by 4 inches, with 1¼-inch air openings. When corn is required to feed or shell, one slat or more is removed and the corn runs out.

WINDOWS.—The other six glazed sashes, three in each gable end of the alley-way, are also 2 feet 7½ inches square, and 1⅜ inches thick, and hung at the top with 3-inch iron butt hinges, and fastened at the bottom with a 3-inch hook and eye.

IRON TIES.—No. 9 iron fence wire ties, two tiers in height, are fixed across the cribs to prevent spreading.

TRUNK.—The trunk in the crib to protect the rod or shaft running from the power to the sheller is 8 feet long, with an inside area of 4 by 6 inches, made of two pieces 2 by 4 and two pieces 2 by 10, with a centre support 2 by 12 inches.

SHOOTS.—The four shoots in the middle floor of the alley-way, for filling the wagons with shelled corn to haul to market, are about 12 in. long and 3 by 6 in. inside area, made of one-inch oak, with a slide at the bottom, running on ⊾ shaped iron to prevent friction, and worked with an oak handle. They are fixed to the joists about 10 feet apart, and range along the centre of the alley or drive-way.

BOX.—The movable box around the elevator on the middle floor of the alley-way, to retain the shelled corn, is about 2½ feet square and 3⅛ feet high, made of one-inch dressed pine.

PLATFORMS.—The two platforms, one at each entrance to the alley or drive-way, are of 2-inch planking, laid on joists and sleepers 2 by 6 inches.

PAINTING.—The sides and ends of the building are painted two coats with white lead and linseed oil paint.

EMBANKMENTS, &c.—The approaches and platforms are embanked with earth, forming slopes for the wagons to enter the ground floor of the alley or drive-way, and the ground is slightly sloped from the building generally, to keep all dry around it.

ESTIMATE OF COST, BILL OF LUMBER, &c.

NOTE.—About 1-12th has been added below for waste, &c.

Fourteen 16 ft. 4 by 8 in. ground sills, 597 ft.,.....
One 16 ft. 4 by 4 in. ventilator post, 22 ft.,.....
Twenty-three 16 ft. 2 by 12 in. joists for cribs, cut to 8 feet length, 736 ft.,.....
Sixty 12 ft. 2 by 10 in. joists for ground and middle floor of alley-way, 1,200....
Sixty-eight 16 ft. 2 by 8 in. planking for ground floor of alley or drive-way and platforms at entrance thereof, 1,450,.....
Seventy-two 16 ft. 2 by 6 in. plates, door and window posts, lintels, horizontal rails at gable ends, ridge piece, joists and sleepers for platforms, 1,152, ...

Fifty-four 18 ft. 2 by 6 in. outside upright studs and outside gable rafters, 972,	
Forty-two 24 ft. 2 by 6 in. joists to upper floor, and roof ties, and upright studs at gable ends, 1,008,	
Ninety 12 ft. 2 by 6 in. inside upright studs between alley-way and cribs, 1,080,	
Forty-five 18 ft. 2 by 4 in. rafters, 540	
Fifteen 16 ft. 2 by 4 in. battens in openings for shelling, studding between joists, trunk, &c., 160,	
Twenty-three 16 ft. 1 by 12 in. lower ties in cribs, cut to 8 feet lengths, 368,	
Twenty-three 16 ft. 1 by 8 in. upper ties in cribs, cut to 8 feet lengths, 245,	
Total of above 9530 feet one inch thick, at $14,	$133.42
Seven hundred feet super one-inch rough boards for flooring in cribs, 700 @ $14,	9.80
Three hundred and eighty-five 16 ft. 1 by 4 in. roof battens or strips, and strips for inside of cribs, 2053 @ $14,	28.74
Three hundred and fifty 16 ft. 1 by 4 in. strips or battens, dressed, for outside of cribs, 1866 @ $15,	27.99
Twenty 16 ft. 1 by 8 in. cant pieces, ventilator boards, hoods to doors, dressed, 213 @ $16,	3.40
Twenty-five 16 ft. 1 by 6 in. angle staffs, at corners, top of hoods to doors, ridge boards, 200 @ $16,	3.20
Three hundred 16 ft. 1 by 5¼ in. common flooring, matched and dressed, in 5¼-inch widths (measured as 6 inches wide) for the middle and upper floors, and wall-lining of the alley-way, upper part of gable ends, sliding doors, &c., 2400 @ $18,	43.20
Fourteen 16 ft. 2 by 2 in. oak fillets on outside of ground sills, on plates under middle floor joists and openings from alley-way to cribs, 75 @ $17,	1.27
One 16 ft. 1 by 8 in. oak for shoots in middle floor, 10 @ $17,	17
Seven 16 ft. 1 by 6 in. oak strips (fence rails) at top of continuous openings under middle floor joists, and for shoots, 56 @ $17,	97
Forty 16 ft. 1 by 4 in. oak strips (fence rails) under ends of lower ties to cribs, top and bottom of continuous openings, ledges to doors, &c., 213 @ $17,	3.62
Two 16 ft. 1 by 12 in. pine, dressed, for box round elevator, 32 @ $18.	57
Twelve 16 ft. 1 by 2 in. oak fillets to four lower doors of cribs and round ten windows, 192 feet run, @ 1 cent,	1.92
Thirteen thousand sawed pine shingles, @ $3,	39.00
Ten glazed window sashes, 2 feet 7⅛ inches square 1⅜ inches thick, @ $1.50,	15.00
Two glazed skylights, 6 by 2¼ ft., and 2 in. thick, @ $2.50,	5.00
HARDWARE, &c.	
Ninety-two No. 9 iron fence-wire ties to cribs about 20 feet long, @ 10 cents,	9.20
Thirty-two wrought iron bolts 5 inches long, ⅛-inch diameter, with nuts and washers for splices, and corners of ground sills, @ 4 cents,	1.28
Four sets of iron suspending hinges, with rolling wheels, extra strong, for large doors of alley-way, @ $1.50,	6.00
Two sets of iron suspending hinges, with rolling wheels, for small doors, @ $1.25,	2.50
Sixty foot run iron carriage bar ⅜ by 2½ inches for suspending hinges, @ 3 cts.,	1.80
Ten 3-inch hooks and eyes for sashes, @ 5 cents,	50
Ten pairs 3-inch butt hinges for sashes, @ 12 cents,	1.20
Six iron stay bars with hasps and staples for doors, @ 15 cents,	90
Four iron rings for large doors, @ 5 cents,	20
Four pairs 6-inch T hinges for lower doors of cribs, @ 30 cents,	1.20
Five kegs of spikes and nails, @ $3.25,	16.25
One hundred pounds white lead for painting, @ 9 cents,	9.00
Ten gallons linseed oil, @ 70 cents,	7.00
One gallon dryers, @ $1,	1.00
Fifteen bushels lime for foundation, @ 25 cents,	3.75
Six loads sand, @ 25 cents,	1.50
Total for materials,	$380.55
LABOR.	
Twenty-five days carpenter, @ $2,	$50.00
Twenty-five days assistant, @ $1,	25.00
Five days mason at foundation, @ $2,	10.00
Five days laborer at foundation, @ $1,	5.00
Total probable cost of the building,	$470.55

PROBABLE EXPENDITURE, &c.—Many western farmers buy in Chicago the lumber cut and sawed exactly for the required scantlings. The crib building is then erected by the farmer himself, his sons or hired laborers assisting. As the whole is spiked and nailed together, without a single mortice or tenon, not much skilled labor is necessary. The materials will probably cost (as above) $380.55, and if one carpenter and a mason are hired, and assistance given them, the labor would probably cost $60, making a total cash payment of $440.55 for the whole building.

This amount might be further reduced about $45 by postponing the ground floor and large end doors of the alley or drive-way, and the two platforms at the entrance thereof, making an immediate total cash expenditure of $395 for the crib building.

Supposing the total cost runs up to $500, it would be equal to 10 cents per bushel for the 5,000 bushels stored.

This building, which is most substantially constructed, would, with a good coat of paint once every 5 years, one renewal of the roof shingling, and a few trifling repairs, last 50 years. The cost, with interest on the original outlay of $500 during that period, would be thus:

Original cost of building, say	$500
Interest thereon for 50 years at 5 per cent.,	1,250
Painting eight times,	100
Re-shingling the roof once,	65
Incidental repairs, say	175
Interest on the cost of painting, re-shingling and repairs,	410
Total,	$2,500

Which, for the 5,000 bushels of corn stored, amounts exactly to one cent per bushel yearly, while the charge at the railroad depot elevators is one cent per pushel per month for warehousing only.

HUSKING, &c.—An ordinary husker can easily pick and crib 50 bushels of corn daily; his wages this winter (1878) are $1 per day, and good board, lodging and washing, or 2 cents per bushel, with board, &c. The ordinary wagons used in the West have a box 10 feet long, 3 feet wide and 2 feet high, which holds 25 bushels of corn in the ear, or 50 bushels of shelled corn; as a bushel of corn in the ear occupies a space of $2\frac{1}{2}$ cubic feet, and shelled corn $1\frac{1}{4}$ cubic feet; it is sold by weight at 70 pounds per bushel for corn in the ear, and 56 pounds for shelled corn.

COST OF SHELLING, &c.—The usual charge for shelling is one cent per bushel, or if in large quantities of 1,000 bushels and upwards at one time, a fraction less. From 1,200 to 2,000 bushels are shelled daily, according to the power of the machine and the length of the day. The owner of the shelling machine furnishes two teams of two horses each, and two men to work it, and the farmer also furnishes two teams of two horses each, and three or four men to assist—(for threshing wheat and oats the owner of the machine furnishes four horses and the farmer six horses; charge for threshing wheat 4 cents; oats, 2 cents per bushel)—and the farmer boards both men and horses, as the practice of having all the hired

laborers in the house to provide for, still prevails on most of the farms of moderate size in the western country, making the life of the farmer's wife and daughters one of hopeless misery.

CANARY BIRDS AND THEIR MANAGEMENT.

By Henry Stewart, Bergen County, N. J.

THE CANARY is one of the most agreeable of household pets. In figure, color and song it is unsurpassed by any domesticated song bird, and with good management its rearing may be made an agreeable, entertaining and successful recreation. This bird is known scientifically as *Fringilla canaria*, and its native home was originally in southern Africa and the adjacent islands of the Atlantic ocean. The Canary islands, which are sometimes supposed to be the home of this little bird, are not so in reality, as it is stated that these islands were stocked with the birds by means of an accidental shipwreck. Canaries have been common in southern Europe for more than 300 years, and were introduced from Italy into northern Europe and England. The wild canary, as now found in

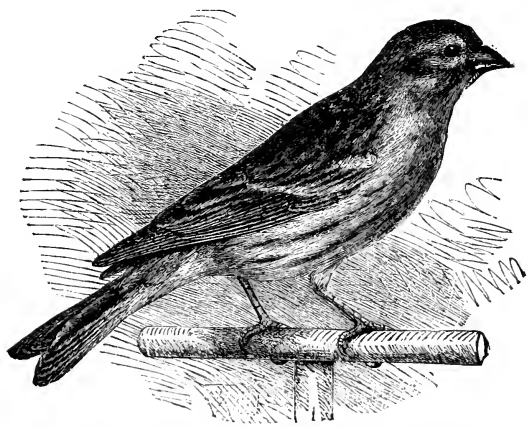

Fig. 191.—*Wild Canary.*

its original home, is an excellent song bird, with a sweet, soft, melodious note which is materially different and superior to that of the cultivated variety. It much resembles in size and form some of the tame varieties, but is green in color, with markings of a darker dusky shade. Fig. 191 is

a portrait of a wild bird brought by some sailors from the island of St. Helena, and exhibited in England in 1875. It may be stated at the outset that only the male sings, a singing hen being a rarity, and a failure as a breeder.

The cultivated varieties have originated chiefly in Germany, Belgium and England, where crossing and training have been practiced by professional breeders and fanciers for many years. By this crossing the form and coloring have been greatly changed, but it can hardly be said that the voice has been improved, although it has been increased in depth and volume. The most common variety both in England and America is the Belgian, an exquisitely graceful bird in its figure and movements; a delicate yellow buff in color, and having acquired, through many years of domestication and training, a greater degree of docility and tameness than any other variety. A perfect Belgian canary should be 7 or 8 inches in length, very slender and sleek, with long legs, sweeping tail, and long, slender neck; close in feathers, and with high shoulders, and a somewhat hunchbacked figure when it takes on a listening attitude, or when its attention is directed particularly to a strange observer. The position shown in the engraving (fig. 192) is very characteristic of this variety.

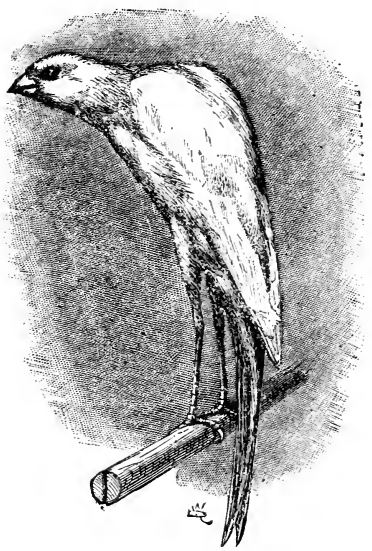

Fig. 192.—*Belgian Canary.*

An enormous business is done in Belgium in breeding, rearing, training and exporting canaries; and good birds bring a high price. A common price in New-York for a well bred bird is $10, and as high as $40 will be paid for a picked bird, or one imported to order. A high class bird is rarely seen in America, because canaries have not yet become a fancy here; but in England, where special exhibitions are made, from $60 to $100 is frequently paid for a bird with good points for mating.

The Belgian is carefully trained for singing; the trainers keep their young birds in small wooden cages piled on shelves, in rooms where a few of the best singers are intermingled with the young birds, as instruc-

tors. The training is usually done at night by the bright light of lamps. A good Belgian canary will sing most melodiously in the evening in a brightly lighted parlor, and especially when stimulated into song by the notes of a piano or other instrument.

The style of breeding common in Belgium, as shown in fig. 192, has been carried to excess in the Glasgow Don, a Scotch bred bird, which is excessively slender in form, and without the shoulder of the Belgian. This bird is very graceful in its outlines, is 6 to 7 inches in length, with a small flat-crowned head; long, almost serpentine, neck; narrow and long back; long, slender thighs and legs; and a slender tail curved forward, so as to give the bird the general contour of an arc of a circle, when in a listening attitude or vigorously engaged in song. The color varies from yellow, buff and flecked, to piebald yellow or piebald buff. The carriage of this bird is

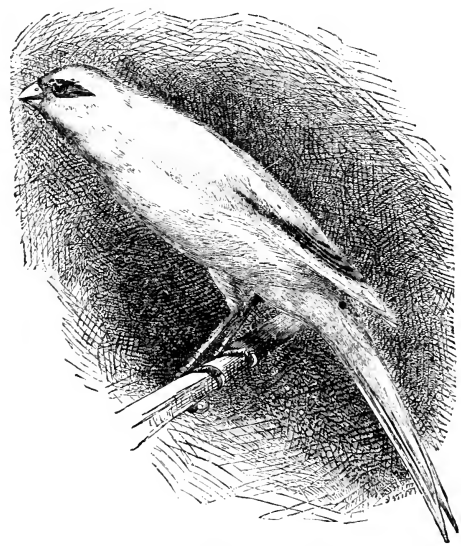

Fig. 193.—*Yorkshire Canary.*

bold, free and saucy, if not somewhat pugnacious. This variety is rare in America, but is highly prized in Scotland, and among Scottish residents here, who frequently bring their favorite pets with them.

The Yorkshire canary, fig. 193, is a popular bird everywhere, and is the type of the most common variety, dividing the general favor with the Norwich canary, fig. 194. These differ very little except in color; the former is clear yellow, clear buff, or mixed yellow and buff; the latter

being orange, or buff mixed with green, or nearly all green. The Yorkshire should be a "straight" bird, long and stout rather than slender, with a full neck and throat; small, flat head; broad, square shoulders; broad, flat back; wings long and meeting at the tips; long, close and compact tail; stout thighs; without any frill on the neck, and of a pale

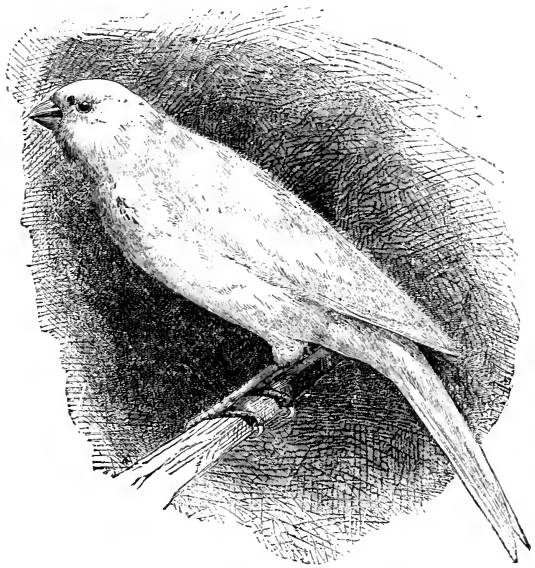

Fig. 194.—*Norwich Canary.*

sulphur yellow or light buff in color. The attitude is not so intrepid and saucy as in the foregoing varieties, but is docile, winning and entreating, and the temper is mild and yielding. This variety can be safely given the freedom of a room, and will make itself very much at home, retiring to its cage when that is brought down for it. It is a most desirable variety, and being less of a fancy than the Belgian, can be purchased at a reasonable price, $3 being a common figure in the New York dealers' stores. The origin of the Yorkshire canary is said to be from a cross of the Belgian on the common mongrel or mixed kind. The Norwich is a high-bred sort, the principal object having been to procure and retain high colors more than any other peculiarity. The brilliant coloring of these birds however has been gained at the expense of other qualities, and has been the result of peculiar stimulating food, such as cayenne pepper mixed with yelk of egg; red beets, cochineal, saffron, annotto, carrots, madder

and other highly colored and flavored food. It has even been known that unscrupulous fanciers, ambitious of distinction, have resorted to artificial dyeing of the feathers, thus emulating some of the questionable practices of the horse jockeys and dishonest cattle and poultry showmen. On this account it is only proper to mention this variety without further detail, because in the amateur's hands it would soon return to its original inferior condition, and become very unsatisfactory property.

Among the less desirable or less noted varieties, except for the breeder, may be mentioned the Cinnamon canary, fig. 195, a drab, sober-colored

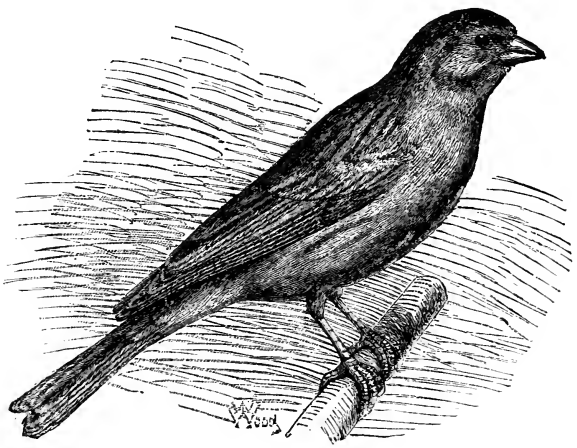

Fig. 195.—*Cinnamon Canary.*

sort, which is in request for crossing to deepen the color of the lighter hued kinds, or to produce the beautifully marked or pencilled feathers which clothe some of the cross-bred birds. This variety has of itself, however, some attractive qualities. The eyes are pink or pale red, even in the newly hatched young; the form is substantial, the color is not unpleasing, and the demeanor is so peculiarly mild, enticing and affectionate that the bird becomes much endeared to its owner. The color most desired in this variety is a deep orange brown, the exact shade being that of the finest qualities of cinnamon, brightened by a clear lustre. This color is evenly distributed over the plumage, light shades or markings being considered detractive. For the breeder there is no more desirable variety to work with than this; it can occasionally be found in dealers' collections in New-York, Philadelphia, Boston or Chicago.

Other varieties include the Gold-spangled Lizard, a popular English variety, handsomely marked, of a golden bronze green on the body,

spangled with yellow; the flight and tail feathers are black, but edged with golden yellow; the breast is well spangled, and the figure is stout and short, 5 inches being the usual length of a full sized bird; and the Silver-spangled Lizard, which differs from the preceding only in having the spangles of white instead of yellow.

The canary has been crossed with some English native finches, more particularly the Goldfinch and the Bullfinch. These are handsomely marked birds, but are desirable for nothing unless it be their brilliantly marked plumage. The cross-bred varieties are unknown here, and possess little interest for us.

Breeding and Rearing.

Success in pairing and rearing canaries depends chiefly upon the careful consideration of the peculiar disposition of the little creatures, which, notwithstanding their diminutive size, sometimes possess as much vice and mischief as much larger birds. When several birds of different sexes are kept together out of the breeding season, as the pairing time approaches, the males will make their own selection of mates, and will exhibit so much attachment for their self-selected partners that they will mate with no others. It is well, therefore, to keep the sexes separate and out of sight of each other until it is desirable to pair them. This should be done from November until January; the males, if many are kept, should be separated in squads of three or four in a cage, as they are quarrelsome, and often fight and injure each other. The hens, being

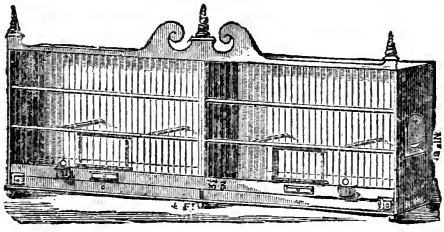

Fig. 196.—*Double Cage.*

peaceable, may be kept in large cages or aviaries without difficulty. Where but one pair is kept there is no need to separate them. The pairing time is in February or March; this depends upon the provision made for lodging the birds. If a warm room is furnished for them, the earlier season may be selected. Before the birds are paired, the male and female which are to be paired (two females may be given to one male) should be placed in their separate cages close together, to enable them to become acquainted and attached. Otherwise a sudden introduction may result in a quarrel and a fight. A double compartment cage (fig. 196) with a wooden

partition or a wired slide in the centre which can be removed at pleasure, is very convenient. This can be furnished with a nest box, (fig. 197,) hung to the wires, as shown at fig. 198, which represents a single breeding cage. Or two single cages with sliding doors (fig. 199) may be hung together and the male introduced to his mate or mates when the proper time comes. When the birds are paired they should be fed liberally on hard boiled egg, finely chopped, or rubbed through a coarse grater or sieve, mixed with crumbs of bread at least twenty-four hours old. Two teaspoonfuls of this is sufficient for a pair for one day. Every second day a small quantity of maw (poppy) seed or hemp seed, or the

Fig. 197.—*Nest Box and Nest.*

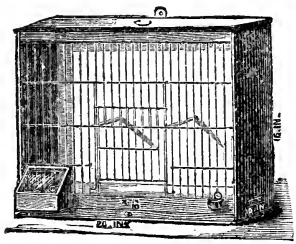

Fig. 198.—*Single Cage.*

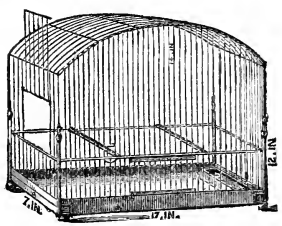

Fig. 199.—*Cage with Sliding Door.*

two mixed, should be given; millet and linseed may also be given as a change, but only in small quantities. After three days the nest should be provided. The lining for this is best made of the hair felting used for covering boilers; or of a piece of soft felt hat brought to a proper shape. A mould to form the nest may be made of a piece of wood turned or whittled to a half-rounded conical or half-egg shape, $3\frac{1}{4}$ inches deep and $2\frac{1}{2}$ inches in diameter. A handle may be fitted in the top for convenience of use. The felt should be cut into a circle of sufficient diameter, and four angular pieces cut out, as shown at fig. 200, to cause it to fit the hollow of the nest. The nest may be made of a small tin cup of the requisite size, viz.: 3 inches wide and $1\frac{1}{2}$ inches deep for incubation, and $3\frac{1}{2}$ to 4 inches wide and 2 inches deep for rearing the brood. The cut edges of the lining are

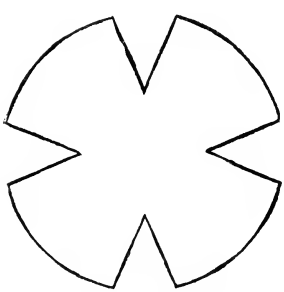

Fig. 200.—*Pattern of Nest Lining.*

sewed together, the inner surface is torn or teased apart, and then pressed down into the nest with the wooden mould previously mentioned. The bottom of the nest or cup should be perforated with two holes, by which the lining may be secured with stitches to the nest box. The nest may be fastened to a strip of tin and hung in the cage to a hook; or it may be placed in the nest box. A section of a small cocoanut shell makes an excellent nest, of a good shape, and durable.

Some Persian insect powder should be sprinkled in the nest before putting in the lining, as a precaution against the parasites which are apt to infest the birds. Canaries will make their own nests, if some teased out wadding or short moss is provided for them, and some of this should be given to them even when the lining is prepared, as they instinctively want to take a hand in their house furnishing.

When the hen is observed carrying materials to the nest, a change of food should be given, as she is about to lay. Some brown sugar should be added to the egg and bread, and some green food, as water cress, mustard or rape, sprouted and grown in a plate of moist sand, in a warm window, may be chopped and given. As each egg is laid, it should be removed, until three are laid, when they are returned, and the hen is set. An ivory egg, or a "blown" egg shell is usefully employed as a nest egg. If the male bird destroys the eggs or troubles the hen while on the nest, he should be taken away, and returned only for an hour or two each day; the partition cage is found useful for this purpose.

During incubation, the hen should be fed as already mentioned, and this is continued until the young birds are six weeks old. The old birds prepare food for the younglings and feed them; the male taking his share with the hen in this labor. After fourteen days the hen will generally begin to lay for another brood, and a fresh nest should be supplied, along with nest material, else she will pluck the young birds. The male will then rear the brood, if the hen takes to a second nest. It is rarely that any trouble is experienced from misbehavior on the part of the male birds. In case neither of the old birds feed the young, they should be fed with food from the trough, rubbed up into a paste and given on the point of a quill toothpick. The natural manner of feeding is for the old birds to disgorge the contents of their crops into the mouths of the young. Often an old experienced male bird will, in this way, feed a young hen and teach her to feed the young as well. When the young birds are able to feed themselves, they may be removed into a separate cage and fed with the mixed egg and bread, and green food, until they are two months old and can crack seed well. A change of food should then be made, and the supply of egg reduced gradually. Washed sea sand, or finely crushed sandstone, washed in salt water, is necessary to be given; a piece of old mortar is also useful, and the floor of the cage should be freshly sanded at least once in three or four days. If the hen's claws become too long, and the feet foul, they should be washed and the claws

clipped with a pair of sharp scissors. It is well to do this before the hen is mated, as it prevents damage to the eggs during incubation.

Some of the high bred birds are very tender, and need unusual attention. After a little experience, good judgment will serve to find a way out of any ordinary dilemma as regards management of the broods, always remembering that over-feeding, cold and uncleanliness are the only serious causes of disease.

In breeding in an aviary, such as may be made by enclosing a sunny bay window, and in which a number of birds may be kept, a dozen hens may be mated with three cocks; and the birds will mate promiscuously. A branchy shrub will provide perches, and a few nests may be hung here and there. An orange or a lemon tree is the most desirable for an aviary and for nesting in. A window, if selected for this purpose, should have a southern aspect, and the enclosure should admit a plentiful supply of warm air. On cold nights a blanket or shawl should be hung about the window and against the enclosure. With this protection, any canaries, even the high-bred Belgians, will not suffer from cold even during severe frosts. Where artificial warmth is thought necessary, an oil stove placed under the floor of the aviary, with a tin pipe to conduct the hot air across the floor will be sufficient. The season of breeding should not be continued later than July, as moulting ought to begin soon after this period.

Every breeder of canaries should be able to make his own cages. Quarter-inch pine lumber, stained of a mahogany shade, by the use of a solution of bi-chromate of potash, is the best material for the smaller cages; larger ones may be made of three-eighths inch basswood cut from large trees, and as basswood admits of easy bending when soaked in hot water, many fancy shapes can be made of it. The wire used is brass or steel, and the tools needed are a pair of wire cutters, a pair of pliers, an awl a little smaller than the wire and ground to an even point all around, as a pin or needle is ground; a light panel saw, hammer, brads, screws, sandpaper, &c. When the wooden frame is made, the wires are cut of the right length and inserted in the holes by means of pressure applied by the pliers; the wires, being a little larger than the holes, are held by the pressure of the wood. The cages shown in the illustrations are easily made, and the sizes are marked on the engravings. When the cages are finished, the woodwork may be oiled and varnished with common copal varnish, or may be simply oiled. The bottom board of any cage should be made to draw out, and be provided with a knob.

THE TULIP TREE.—The Gardener's Monthly says that this fine ornamental tree is becoming extensively planted in many parts of the country, and adds that "one reliable nursery assures us that their sales of it during the past 20 years, for ornamental purposes alone, cannot have been less than 30,000 trees."

NOTES IN RURAL ECONOMY.

UNDERDRAINING IN WINTER.—We gave some directions on this subject in a former volume of RURAL AFFAIRS, and now present to our readers some additional suggestions:

The chief object in winter ditching is to avoid the difficulty of frozen ground, which some regard as impossible in a severe climate, but this difficulty is easily overcome if simple precautions are taken. Farmers who are hurried in spring and summer, and men who wish to obtain employment the year through, will both be benefited by performing what draining may be accomplished at this season.

The ground selected for the work should be dry, which is nearly always the case with soils in winter, the heavy soaking coming after the spring thaw.

Different farmers have their various modes for beginning a ditch, some saving labor by plowing a narrow land on the intended line, throwing the earth outward, and leaving a dead furrow where the ditch is to be, and repeating the operation once or twice more. Others prefer a smooth, level surface, and do all the digging by hand, or loosen up the soil with a subsoil plow, to be thrown out by hand. It is of course advisable to start either with a few furrows with the plow, or by digging first a foot deep before severe freezing weather sets in. After that the bottom of the ditch is kept from freezing by always leaving over night a *few inches of mellow earth in the bottom*. If this is well pulverized, it will be so good a non-conductor of heat that the hard earth on which it rests will not be frozen. If the soil is wet, it cannot be perfectly pulverized, and hence the importance of working in a dry soil, as already stated. The accompanying diagrams mark the depth of the frozen earth, by the shaded parts or slanting lines. As shown in fig. 201, if the ditch is cleared out, leaving a hard, smooth surface at the bottom, the cold air will settle in it, and while level soil is frozen down a foot, the bottom will be frozen to a depth

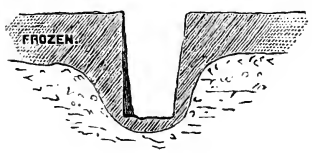

Fig. 201.

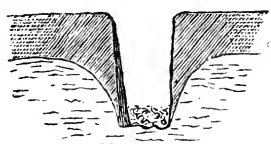

Fig. 202.

of from one to three inches, ranging with the depth and width of the excavation, and the coldness of the weather. The narrower the cut, the less it will freeze, on account of the heat imparted from the warm earth at the sides. Fig. 202 represents the small bed of pulverized earth

in the bottom, and the consequent protection which it affords from freezing, the shaded portions on each side showing the depth to which, in this case, the frost penetrates. The only precaution, therefore, to prevent the bottom from freezing over night, or during other absence of the diggers, is to loosen up the earth as the last thing before leaving, and the more finely it is broken the better. If the subsoil or ditching plow is used, it may be passed a few times for this purpose; if the work is all done by hand, the ditcher loosens up a mellow bed with his pick. When the work is resumed, the loose earth is thrown out and the work goes on as before. When the digging is completed, the tiles should be placed in position and covered to a small depth with the last fresh earth thrown out, and it may there remain till spring, when the remainder of the earth is thrown in. It will not do to leave the ditch open without placing the tiles in position, as freezing and thawing will partly fill it with crumbling earth. If laying the tile is carefully done, it may be commenced at the lower end of the drain, and the work extended upwards as the digging progresses in that direction.

CONSTRUCTION OF PIG-PENS.—The following description is furnished by John I. Carter of West Grove, Pa.:

No animal that we feed is more sensitive to wet and cold than the hog. The evaporation of moisture from his unprotected skin, or a cold current of air against him, chills him to his serious injury. Hence a good winter pen should secure warmth, dryness and freedom from draughts.

A pen should be tight enough to keep it above freezing, and so arranged that the pigs will have no opportunity to get damp. Their bed should be as far as possible from the feeding pen, that no moisture may be carried from the trough to the bed. They should not be allowed to drop their manure on board floors, depending on frequent cleaning to keep the pen sweet, for it cannot be done. They must have a dry manure yard where a body of manure may readily absorb all urine and other moisture, and be kept sweet with earth and plaster.

The following plan will secure these ends: A single tier pen should be 22 feet wide (length indefinite)—the pen running east and west if suitable. On the north side (or middle) an entry 4 feet wide; next a trough and feeding floor 5 feet wide, with an inch to the foot fall for the hogs to stand on while feeding; then a manure yard 8 feet wide, with cemented bottom, one foot lower than the feeding floor. Back of this again is the sleeping pen, 5 feet wide, and floored like the feeding pen. A slight fall in this floor towards the manure yard will carry off chance moisture; and a narrow board will keep the bedding from working down. This arrangement affords every convenience for the pigs to drop their manure in the proper place, *i. e.*, the manure yard, in passing from the sleeping pen to the trough, and the same opportunity is offered on their return.

This pen can be divided into compartments of about 8 feet, separated by low partitions. A lifting gate will divide manure yards, and a large

door on each end of the pen will admit a wagon for cleaning out the manure. The eaves of the roof may run within 4 feet of the ground, as height of roof over the sleeping apartments is not required. A sliding window opposite these apartments will be convenient for putting in fresh straw. Skylights in the roof will increase warmth, and admit light. The arrangement of store-rooms, &c., can be made to suit taste, and a double tier pen would no doubt be most economical.

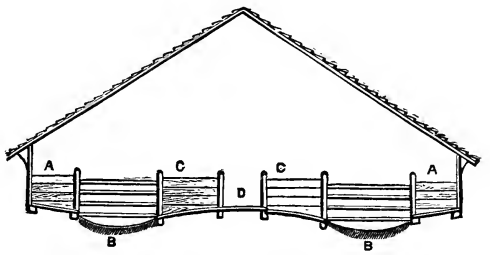

Fig. 203.—*Construction of Pig-Pen*—A A, *Sleeping Apartments*, 5 *feet wide*, 5 *inches fall*; B B, *Manure Depressions*, 8 *feet wide*, 1 *foot deep, with lifting gates*; C C, *Feeding Floors*, 5 *feet wide*; D, *Entry or Centre Alley*, 4 *feet wide. Partitions are* 3 *feet high*; *Entire width, as above represented for double tier of pens*, 40 *feet.*

I might farther add that if the compartments were made 8 feet wide, then the lifting gates could be turned around and enclose either the sleeping or feeding pens, and thereby facilitate the shifting of the hogs from the different pens.

How to Cut Ice.—N. Atwell of Van Buren County, Mich., gives the following useful directions:

A good cross-cut saw is the most convenient tool to use. A good pair of ice-tongs is the best instrument with which to haul the cakes out of the water, and also to handle and load them. The cakes should be as large as they can be without inconvenience in handling. I make the cakes 21½ by 27 inches. Twenty cakes of this size will complete one layer 9 feet square. The second layer has the cakes placed crosswise of the layer below, and so on to the top. This binds the whole mass together. If the bottom layer is level, and the cakes are of uniform size, with square edges, they will fit together nicely, making pounded ice between them unnecessary.

We find that it is less than a day's work for a man to saw out an abundant supply of ice for an ordinary family. During warm weather ice will unavoidably melt from the outside of the mass, and if neglected, a vacancy is soon formed between the ice and the sawdust. It is very important that the sawdust be packed down often, thus preventing the admission of warm air. When we commence marking and sawing ice, we find it an advantage to make the headings widest where we

commence to saw them. They can then be removed without binding or wedging fast.

MAKING WIRE FENCE.—A correspondent of the COUNTRY GENTLEMAN says: Having occasion the past summer to fence a pasture in Southwestern Kansas, I came to the conclusion to use the steel barbed wire, as being the best and cheapest material to allow immediate use of the pasture, in that almost treeless country. I was worried to know how to make that strong and hard wire "taut," when I hit upon the following plan. It worked admirably; without it I do not know how I could have succeeded in making a good job. I used the twisted double wire, with four barbs about 6 to 8 inches apart.

The accompanying engraving (fig. 204) will show how the machine was constructed, and also gives an idea how it was used. We loaded on two spools of wire, by running an iron bar through them, and placing them up where the roller or windlass is represented. We fasten the wires to the corner post, at the proper distance—one 3 feet 10 inches from the ground, the other 16 inches below. This makes a good cattle fence, but three wires are better. We then start up the team; the wire runs off the spools; a man lays them along the posts, and when at the next corner posts—say one hundred rods from the place of starting (more or less is no matter)—we cut the wires take off the spools; place the machine against the corner post, as shown in the cut; put the windlass in place; make a small loop on the end of the wire; put it on the hook at the end of the rope, and proceed to wind up. When the wire is "taut" we fasten it to the corner post with staples; then drive staples along in every post. We proceed in like manner with the second wire, and that line of fence is finished.

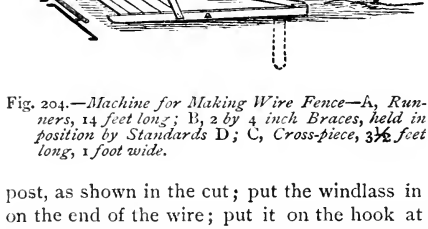

Fig. 204.—*Machine for Making Wire Fence*—A, *Runners, 14 feet long;* B, *2 by 4 inch Braces, held in position by Standards* D; C, *Cross-piece, 3½ feet long, 1 foot wide.*

I found a little iron plate, or piece of steel bar iron, a good help in making the loops and splices in that hard, strong wire—a great saving on the hands, &c. To make it take a piece of steel bar three-quarters of an inch wide, one-eighth of an inch thick, and say 6 inches long, and drill a hole in the centre large enough to receive the wire. By putting the end of the wire through this hole, it can be bent to any required shape, without hurting the hands.

The crank used on the windlass is not shown in the cut. I set the posts 25 feet apart. At the corner I put a brace 12 feet long, to prevent the posts from being pulled up when straining the wire.

A DRAINING LEVEL.—I use a simple and not expensive carpenter's level with sights, and a hole in the bottom to fit the stem of a surveyor's compass staff (fig. 205); (a set screw on the side of the staff would be almost as convenient.) With this level and a good rodman I lay off hillside ditches to prevent hilly land in cultivation from washing; drain low land; dig cellars; lay the foundation for houses, and set gate posts. It is also convenient and useful to measure the "cut and fill" in grading roads, and in short for any use on the farm requiring a level or perpendicular. I could not get along without it. The accompanying cut describes it sufficiently.—A. R. DAVIS, in COUNTRY GENTLEMAN.

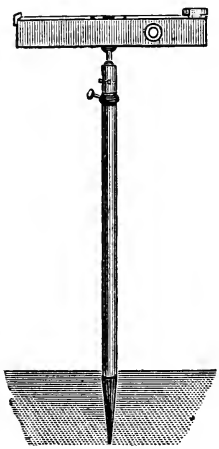

Fig. 205.—*Draining Level.*

Fig. 206.

SYPHONS.—On page 82 of vol. VI of RURAL AFFAIRS, a contrivance is figured and described for removing the air from the upper curve of a syphon used for obtaining a water supply, when by the gradual accumulation of air bubbles that part becomes filled with air, and the flow of the water ceases. A correspondent of the COUNTRY GENTLEMAN describes another mode, simpler in construction, and accomplishing the same purpose. The accompanying figure (fig. 206) exhibits this contrivance, the two breaks in the pipe showing the length between the centre or high part and the two ends. A piece of pipe a foot long is soldered on at the apex of the syphon (see fig. 206.) This has an air-tight screw cap upon it. A common tap or cock is fitted to each end of the syphon. When the flow stops these cocks are shut, the cap is unscrewed, and water is poured into the vertical pipe until it overflows, and all air bubbles have escaped. The cap is screwed down again, the cocks opened, and the flow continues. A few pints of water, or less, may be sufficient to start the flow.

A GOOD FARM GATE.—The accompanying cut represents a gate used on the farm of George Geddes. Its leading merits are that it is made wholly of pieces of board or plank of the same width, and there are no mortices. The pieces of board of which it is made are seasoned, cut the right size, and painted, and then they may be bolted and riveted

together to form the gate, in twenty minutes. It is so firmly braced that any weight which may be placed upon it will not cause it to sag in the least.

The gate represented in the cut (fig. 207) was made of greater height and strength than would be usually necessary for common farm purposes, and was intended to form an effectual barrier against young horses. The lumber of which it is made is pine, 1¼ inches thick and 5 inches wide, painted before the pieces are put together. It is 10 feet long and 5 feet high. The two ends are vertical strips on each side of the ends of the horizontal bars, well secured with screw bolts, two being placed at each crossing or intersection. The upper space between the bars is 7 or 8 inches; the others become gradually less towards the bottom. The heel end is 6½ feet high, but Mr. Geddes thinks the whole would be strong enough without this upward extension, and with the two ends of the same length. The hinges embrace the heel-piece, and are made by bending a thick iron strap or flat bar, without any welding, as shown in fig. 208, two screw bolts securing them firmly. The eye or socket being placed at the corner, the gate may be swung wide open. The firm bracing which this gate possesses enables it to bear any weight; if a horse in attempting to leap it should rest on it, he would not cause it to yield. Fig. 209 shows the face of the lower corner brace.

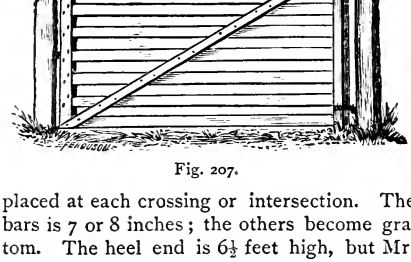

Fig. 207.

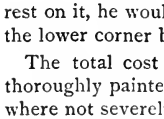

Fig. 208.

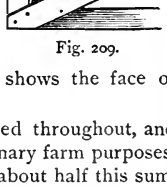

Fig. 209.

The total cost of such a gate, made of pine, bolted throughout, and thoroughly painted, would not exceed $3. For ordinary farm purposes, where not severely exposed, a gate may be made for about half this sum, by selecting the best hemlock, using in part stout wrought nails, and oiling the rough surface with crude petroleum, instead of painting. In this case five boards, or even four, would answer, making the gate 4½ feet high, and employing wider pieces.

The iron for the hinges is 1¼ inches wide and one-quarter of an inch thick.

CHEAP FENCE.—The fence shown in the cut (fig. 210) has been much employed by Geo. Geddes, as well as by other farmers. The best mode of construction and cost of making has been carefully ascertained by Mr.

Geddes. The rails which were employed in the old zig-zag fences were used, the sound ones being selected. Enough were thus obtained to build the whole of the new fence, including the vertical stakes. The fences made according to this mode have been constructed by one man, who understands the business, at the rate of eight rods in a day, digging the holes, and doing all other parts of the work. He has 20 cents per rod for the entire work, and earns $1.60 a day.

Fig. 210.

The old rails being 12 feet long, and lapping one foot at the ends, give 11 feet for each length, or three for 33 feet, or two rods. The holes are dug 3 feet deep; the workman, with his tools specially adapted to such digging, making narrow excavations at much less labor than common laborers would accomplish with spades. The two stakes are set in the hole, the earth well pounded around them, the rails placed in position, and two wire loops, as shown in the engraving, hold them firmly together. Occasionally it is necessary to insert short pieces of rails between the ends, to give full height to the fence, for which five rails will answer in common cases.

FARM ROLLER.—W. J. Fowler gives in the COUNTRY GENTLEMAN the following description of a farm roller:

"The roller was in three pieces, which itself is nothing new, but the centre part was placed behind the others in a separate frame, and attached by a **V**-shaped smaller frame, the sharp point of which rested on the large frame containing the two forward rollers. This arrangement entirely remedies the general difficulty in using rollers, that the weight of the implement bears heavily on the horses' necks. The hind roller attached to the back of the frame balances it so that the tongue is no heavier than that of a wagon. This roller was a log about 2 feet in diameter, cut in three pieces, and each roller bound at each end with iron, and held together by a light frame (see fig. 211).

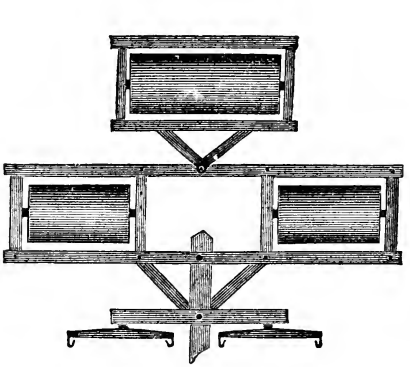

Fig. 211.—*Farm Roller.*

Each piece moves freely, and there is no plowing of the ground when turning corners of the field. The back roller may be a trifle longer than the space between the others, to insure crushing all the ground. There is no patent on this form of roller, and it can be made of logs, plank, or iron, as preferred. The one I saw was so simple that a good carpenter or blacksmith could make it."

DRAINING IRREGULAR SURFACES.—George Geddes gives the following directions in the COUNTRY GENTLEMAN:

"When the snows go off in the spring, large streams sometimes follow the valleys, and often cut deep gulleys, and drains laid along the lowest grounds are torn up. To avoid this, two drains (using smaller tiles) are effectual—each being laid a little way from the centre of the valley, and deep enough to drain it thoroughly. The two drains sometimes will cost more than the one, but not always, as the side branches are so much shortened, as is shown in the following cross-section of a field (fig. 212) having

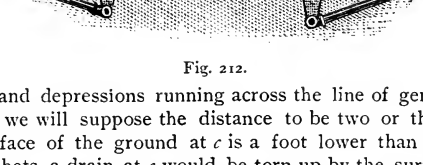

Fig. 212.

undulations and depressions running across the line of general descent. From *a* to *b* we will suppose the distance to be two or three rods, and that the surface of the ground at *c* is a foot lower than at *a* or *b*. In times of freshets, a drain at *c* would be torn up by the surface water (if the descent were sharp) that perhaps only runs for a day, while drains at *a* and *b* would be undisturbed, and when the freshet was over, carry off all surplus water."

STACKING CORN FODDER.—The fine fodder raised by sowing corn thickly in furrows or drills, cannot be dried in the field after cutting, sufficiently to prevent heating and spoiling, in stacks. We gave directions to obviate this difficulty on page 143 of vol. VI of RURAL AFFAIRS. A ventilating chimney in the centre of the stack proves of much advantage by allowing the heated air to escape, a few rails being set up together, and chained at the top till the stack is built around them. The objection to this mode is that it does not provide for the admission of air at the bottom to maintain the ascending current. This difficulty is partly obviated by building the stack on an open structure of rails and coarse brush.

A better and very perfect way, is to place the rails upright around a tree, the upper ends leaning against the lower branches. Where maples and other shade trees have been planted on farms, it often happens that just such trees are at hand. The rails are so placed that an opening is

left on each side when the stack is built, for the wind to blow through freely, as shown in the plan, fig. 213, and in the section, fig. 214. Arranged in this way, it is nearly impossible for the sown fodder to become injured by heating, if the walls of the stack are not much thicker than the length of the bundles.

But it often happens that such

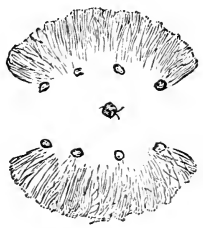

Fig. 213.

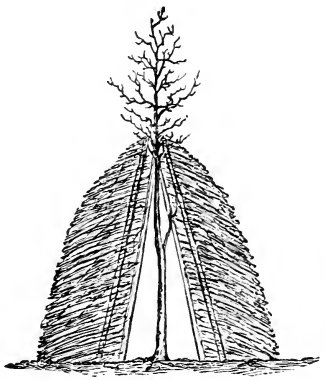

Fig. 214.

trees of the right height are not at hand, and a much improved modification is obtained by inserting two forked sticks in the ground, about ten feet up to the forks, and at a convenient distance apart, and placing a horizontal pole on them (fig. 215.) The length of this pole will determine their distance asunder. Then set a number of rails nearly upright or slightly leaning, with the upper ends against the horizontal pole. Against these vertical rails the oblong stack is built, open at the ends, through which the wind freely blows. A series of forks will admit of the stack being made as long as may be desired for any amount of fodder.

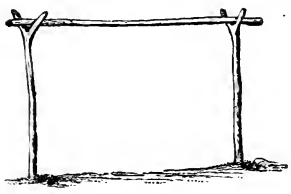

Fig. 215.

PUMPING WATER UP HILL.—A correspondent of the COUNTRY GENTLEMAN describes the following contrivance in answer to an inquiry for the best mode of obtaining water from a spring 225 feet distant from the house and 15 feet lower: "A lead pipe of 1¼-inch bore should be laid under ground below the reach of frost (perhaps 2 feet deep), from the spring to the house. A well 16 feet deep should be dug where he wants the pump. The pipe should be carried to the bottom of the well, turned and brought up into connection with the pump upon the surface of the ground. (See fig. 216.) A pump of the best construction should be used. Blunt's Universal pump would be the best, as it is the most perfect one I know of, and will pump air as well as water. With this arrangement there will

be the advantage of a syphon; the pipe will always be charged with water; the 15 feet elevation may be reduced to 11 feet by digging the ditch for the pipe 4 feet deep at the upper end, and the water may be always brought up from the spring by the use of the pump mentioned. By using the non-freezing pump, made especially for the purpose, and which is a force as

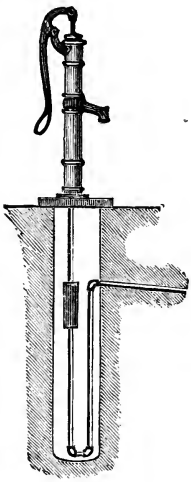

Fig. 216.

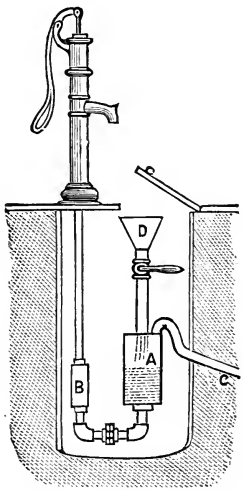

Fig. 217.

well as a suction pump, water may be drawn in winter without trouble from frost, and many uses may be made of it for the barn and house."

A check valve should be placed at the foot of the pipe to keep it always full. A small hole drilled in the pump tube 3 feet below the ground and above the lift, will let out the water down to that hole, and there will never be any danger from frost. The writer states that he used this mode a few years ago with perfect success.

Another mode is described in the same journal by H. L. Emery, and although more expensive and complex, possesses some advantages. It is shown in the annexed cut, (fig. 217,) an excavation of moderate depth being sufficient. The air-chamber and reservoir *A* is made of strong, riveted and galvanized iron, about one-sixth of an inch thick, and with convex heads, to withstand pressure. It is first filled with water through the funnel *D*, and the stop-cock at *D* is then permanently closed. The pump at *B* is set in motion, and takes the water from *A* at each stroke, and leaves a partial vacuum. In this case the water is to be elevated in the long pipe 15 feet, requiring a half vacuum. Therefore when *A* is

over half empty, the water is drawn up through the long pipe from the spring. A continuous flow is thus effected, the chamber *A* proving a regulator, and the flow is smooth and easy. The chamber should be large enough to hold as much water as the long pipe, which is easily determined by calculation. The long pipe should be at least an inch in bore—better and with less friction if an inch and a quarter.

DRAWING OFF CORN.—It sometimes becomes desirable to draw off corn as soon as it is cut, before husking. We have adopted a contrivance for this work, which we find quite convenient, and with which we do the work rapidly. It has the advantage of a low sled, without its hard draught or friction. The contrivance is shown in its general construction in fig. 218. It consists of a long and broad frame, suspended by chains under

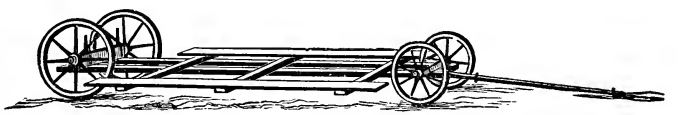

Fig. 218.

the axles of a common farm wagon. In order to give sufficient length for a long load near the ground, a reach 20 feet long is used, throwing the forward and rear axles 18 feet apart. We used a locust pole, cut from a thick grove where the trees were tall and slender. It curved downwards nearly a foot, so as to bring the platform near the ground. Just within the rear and forward wheels and closely under the axles, two stiff pieces of timber, one on each side, were chained to the axles. These timbers were over 20 feet long, 4 by 6 inches, and sound, clear hemlock. Cross-pieces 7 feet long were spiked to these long timbers, extending outward beyond the wheels, on which were nailed 2-inch boards, for an outer railing. The frame or platform was thus 7 feet wide, over 14 feet between wheels, and a little more than a foot above the ground; and it was thus ready for service. The materials did not cost $2, and two men rigged it in an hour or two. Fig. 219 is a cross section, and shows the details more accurately.

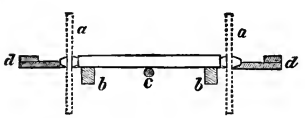

Fig. 219.

Small sized shocks of cut corn were placed rapidly on this low frame and drawn off the field to the place where they were to remain. It was found most convenient to place the shocks in double rows in their new locality, like the double-row wheat shocks made of the sheaves in the field.

If the shocks are large, it is inconvenient to handle them; if rather small, two men with a rope will place them on the load with ease. We

found no difficulty in loading a full ton of the corn on the long frame without making a high load.

In some instances it will be found easiest to place the stalks on the load while cutting, and to draw them off as fast as the load is made.

There are three advantages in being thus enabled to draw the corn from the field. Many farmers do their husking under shelter, in rainy or stormy weather, and this enables them to secure an easy supply. Some have their cornfields in exposed places, remote from the dwelling, where the corn is liable to be pilfered. One farmer, near a large village, last year estimated that he lost in this way fifty bushels from a few acres. A third advantage is in clearing the ground for sowing wheat, which has succeeded well where early corn has been planted, and the soil is rich naturally or with previous manuring. Some heavy wheat crops have been obtained in this way, although the practice has not been generally adopted in grain regions, on account of the labor of moving the corn in time, and because early ripening sorts have not been planted.

PROPORTION OF GRAIN TO STRAW.—E. W. Stewart, writes as follows in the COUNTRY GENTLEMAN: "The question has no doubt often arisen as to the relative weight of grain and straw in a wheat, oat or other grain crop—that is, in a ton of grain in the straw, as it comes from the field, what proportion is grain and what proportion is straw? This has been determined frequently in England, but seldom in this country. In 1876, from 27,760 pounds of spring wheat in the straw, as it came from the field, after sweating and curing in the mow, we threshed out 157 bushels, or 9,420 pounds of wheat. This is one of grain to 1.94 of straw, or 33.9 per cent. of grain to 66.1 per cent. of straw. The same year, from 30,200 pounds of oats in the straw, after remaining two months in the mow, we threshed out 12,678 pounds of grain, or one of grain to 1.36 of straw. This is equal to 42 per cent. of grain to 58 per cent. of straw—a very large proportion of grain.

"In 1877, I put in barn 26,469 pounds of spring wheat in the straw, and after lying in mow two months, threshed out 9,198 pounds of grain, which is one of grain to 1.87 of straw, 34.7 per cent. of grain to 65.3 per cent. of straw. I also put in mow 60,000 pounds of oats in the straw, and threshed out 802 bushels, or 25,664 pounds, being one of grain to 1.34 of straw, which is 43 per cent. of grain to 57 of straw. The average of the two years was—spring wheat, one of grain to 1.90 of straw; oats, one of grain to 1.35 of straw. In the latter year from 12,995 pounds of peas and oats raised together in the straw, we threshed 4,000 pounds of grain, or one of grain to 2.22 of straw. This is a larger yield of grain in wheat and oats, than is generally reported in England. It is generally calculated in wheat, one of grain to two of straw; and in oats, one of grain to 1¾ of straw. My oats this year had a large proportion of long straw, and I was surprised to find so large a proportion of grain, but the oats weighed 35 pounds to the bushel measure. I find this weighing very convenient, as

it enables me to know within a few bushels how much grain I have. With scales convenient, it costs nothing to weigh, and the knowledge serves an important purpose."

ITEMS IN DOMESTIC ECONOMY.

THERE ARE MANY SMALL CONTRIVANCES that would save petty annoyances if generally understood, among which the following are worthy of brief notice and description:

MEDICINE IN A SPOON.—In dropping out of a vial simple remedies, the operator commonly holds the spoon in one hand and drops with the other, often spilling a portion of the contents in the attempt to insert the cork, or to add water. To obviate the help of a second person, thrust the handle of the teaspoon between the leaves of a book, and it will be held securely without trouble, as shown in fig. 220.

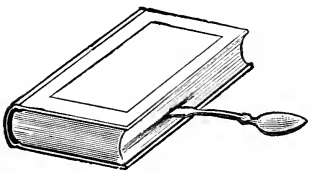

Fig. 220.—*Convenient Spoon-Holder.*

USING A MICROSCOPE.—A common hand microscope may be used to advantage in looking for or removing a thistle or splinter from the hand, but the operator wants a third hand while holding the glass with one and looking at the other. Adopt the same course as for the spoon, and both hands are free.

KEY OR COIN IN A LETTER.—A common way of enclosing a coin, key, check, &c., in a letter, is to put it in loose, leaving it to slide about, and sometimes to be lost out. The right way is to fold it in a piece of paper, and then to fold the paper around it, leaving a broad, flat wing, so that the coin cannot slide or rattle. If this paper wing is about the size of the inside of the letter, it will remain very secure, as shown in fig. 221. The dotted circle shows the coin.

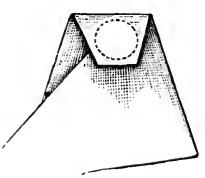

Fig. 222.—*Coin in a Letter.*

PINS FOR HANGING.—A good hat or coat stand may be made by selecting a tree with regular limbs (a spruce or cedar tree is usually best); cut off the limbs (fig. 222) so as to leave stumps six inches

Fig. 222.—*Hat Stand.*

long, shave off the bark, dress the whole neatly, varnish it, and affix it to a plank base. Coats and hats may be hung on this stand more conveniently than on most of the costly supports sold for this purpose. The same kind of support may be used on a larger scale in carriage houses for hanging harness, bags, &c., and the large posts in barn basements, if made thus of the trunks of trees with the limbs sawed so as to leave projections, would be found convenient for many purposes.

POSTAL CARDS.—Where several of these are used, they are apt to adhere slightly together, and two are picked up for one, and mistakes made in this way. To prevent such mistakes, bend them slightly, or bend one corner, and they cannot lie closely together.

HOW TO HANG A THERMOMETER.—Thermometers are commonly hung on a nail for determining the temperature of a room or church. Persons brushing hastily past often throw them off the nail and break them. Or, if thus hung out doors, the wind sometimes blows them off. To prevent all accidents of this kind, at no cost, and with half a minute's work, drive two nails instead of one, just far enough apart to allow the wire loop of the thermometer to pass between them—fig. 223.

Fig. 223.—*Hanging a Thermometer.*

TO LEVEL A CLOCK.—When a clock is not adjusted to a perfect level, it ticks unequally, runs with less accuracy, and is more liable to stop. A quick ear will detect the unequal strokes of the pendulum, and will adjust the level with considerable accuracy; but an easier and more perfect way is to *measure* the distance of each ticking point from the centre. Suppose for example that the pendulum when at rest is represented as in fig. 224, and that when slowly moved by the hand it ticks at *a*. Make a mark at this point, and then slowly move the pendulum till it ticks again on the opposite side at *b*. These two points, it will be seen, are at unequal distances from the pendulum. Then wedge up one side of the clock until the pendulum hangs exactly midway between them, as in fig. 225, by careful measurement. The ticking will then be equal.

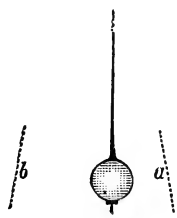

Fig. 224.—*Misadjusted Clock.*

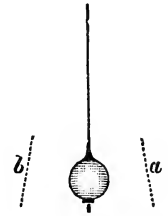

Fig. 225.—*Adjusting a Clock.*

WEIGHING LETTERS.—The small balances used in kitchens may be used for determining the weight of letters and small packages to be sent

by mail, by reckoning 60 cents in silver as half an ounce, the weight of one letter of 3 cents postage. If the letter balances half a dollar of U. S. currency, it will be safely within weight. If the letter weighs only a quarter of a dollar, a 25 cent coin may be enclosed and still be light enough to pass with single postage. And at the same rate for larger packages.

OILING LATCHES.—Passing through the different rooms of the house once a week (say every Saturday evening, or other regular stated time,) and touching the latches, locks and hinges of the doors with a drop of kerosene or a little tallow from the candle, will keep them well lubricated, and the doors will always shut smoothly and quietly, instead of jarring, grating or creaking, and the doors and latches will both last the longer for this regular attention.

REMOVING BOX COVERS.—Those who receive seeds, fruits, plants and various objects of merchandise in boxes, often split and destroy the covers in taking them off, when they might as well be preserved entire for the next time the box is used. Procure two hard-wood wedges a few inches long, and half an inch or an inch square, and set one of these in the crack between the lid and box, near a nail, and drive it in with a hammer. It will raise the lid slightly, when the other is inserted and treated in the same way. In this way the cover is taken off entire without harm to the box or its contents.

A CONVENIENT WASH-TUB.—L. D. Snook gives in the COUNTRY GENTLEMAN the following description: "The sides are 5 feet in length and 15 inches high; the bottom is also 15 inches wide. The top of the box should be 18 or 20 inches wide. It should be made from 1¼-inch well seasoned pine stuff, and put together with white lead in the joints, and held in position by a liberal use of 2½-inch wood screws. A carpenter will put it together in less than half a day.

"The section *A* (fig. 226) is used for washing the clothes, while *E* is used for rinsing, or bluing, as the case may be. If a wringer is used, at-

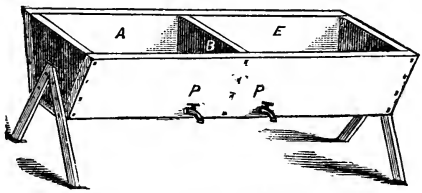

Fig. 226.—*Convenient Wash-Tub.*

tach it to the partition *B*, or at the end as the progress of the washing demands. Insert faucets at *P P*. The wash-room may be so arranged as to convey the suds, &c., directly into an outlet pipe or drain, which will save much lifting. Make its legs of any length desired. Handles may

also be attached at each end for more easy handling. This arrangement is cheaper than ordinary wash-tubs, and will be found far more convenient."

HOARSENESS IN SPEAKERS OR SINGERS.—A few drops of nitric acid in a glass of sweetened water, taken twice daily.

BLISTERS FROM BURNS.—The pain is quickly relieved by immersion in a saturated solution of salt.

TO PREVENT A FELON.—When a felon is threatened on the finger, by approaching inflammation and a sensation like a sharp thorn inside, apply immediately *tincture of iodine* until a blister is produced, say every half hour more or less, and repeat the blistering as often as required. If taken in time, this remedy will mostly avert the disease. The same application, less frequently, will cure many of the small sores or small external annoyances on the hands or elsewhere.

CANKER SORE MOUTH is most easily cured by touching it once a day with a small crystal of blue vitriol, commonly called blue stone.

NOTES ABOUT FRUIT AND FRUIT CULTURE.

NUTRIMENT IN FRUIT.—R. F. Kedzie of Lansing, Mich., has published, in the Pomological Report of that State, the analyses of different kinds of fruits, to show the amount of nutriment they contain as compared with common articles of food. Among other results reached in this examination are that an egg weighing 794 grains (over an ounce and a half) is equivalent in nutritive power to 17 ounces of heart cherries, 22 ounces of grapes, 30 ounces of strawberries, 40 ounces of apples, and 64 ounces of pears. These figures show the comparative value of the different kinds of fruits for food, as shown simply by analysis, heart cherries containing the largest amount of nutriment and pears the least. But fruits possess a higher real value than is shown by analysis. Well ripened, and in moderate quantities, they are more easily digested than many of the richer foods, a part of which may be lost. But they assist in promoting the healthy action of the digestive system, and in this way perform a most valuable service. It is well known that the inhabitants of newly settled regions are far less liable to become attacked with diseases resulting from malaria, if allowed to partake of regular supplies of well ripened fruit, even if in a dried state. Among the common foods containing the largest proportion of nutriment are eggs, fresh meat, such as beef, pork, veal, fish and mutton, bread made of wheat flour and Indian meal, and rice. These contain about three to five times the amount in potatoes, and more than ten times as much as in carrots, parsneps and turnips. The three last named substances contain nearly the same as the richest fruits, as indicated by analysis.

HEALTH PROMOTED BY FRUIT.—We have given on several former occasions some striking facts showing that prevalent diseases are in a great measure prevented by a regular and moderate supply of well ripened fruit, especially in newly settled countries. We observe in some of the agricultural papers the statement of Dr. B. F. Dunkley, of his experience since he first went to Missouri, thirty years ago. Orchards were few at that time. Diseases of the bowels, lungs, &c., prevailed, and were often fatal. Malignant dysentery afflicted many families. In the absence of other fruit, Dr. D. told many of his patients, to their surprise, that they needed no medicine other than oranges and lemons. Now that fruit and vegetables are abundant, diseases are fewer, less malignant, and yield more readily to treatment. When orchards began to bear, it was observed that children who ate regularly and plentifully of the fruit had excellent health, while mortality prevailed when there was none.

FRUIT AS MEDICINE.—A paper written by P. Holloway was read at a meeting of the Lucas County (O.) Horticultural Society, in which he spoke strongly in favor of the beneficial effects on the health of eating blackberries. He had cured himself of dyspepsia by living upon a small quantity of bread and butter, accompanied by strawberries, raspberries, blackberries and peaches, in their respective seasons. The president thought blackberries the most wholesome of all fruits.

THE FRUIT CROP.—Ex-Governor Furnas of Nebraska stated at a recent horticultural meeting that the fruit crop of this country in 1877, was estimated at $143,000,000. If shippers to foreign markets will build up a reputation for supplying only the best in quality, the value of the crop will undoubtedly greatly increase.

SELECTION FOR A FRUIT GARDEN.—The occupant of a new place wishes a selection, or moderate list of varieties of the large and small fruits for spring planting. In giving a list for this purpose, every cultivator would vary more or less in naming different sorts, according to personal preference founded on diverse tastes, varying success with soil, and with cultivation and keeping; but there are a few sorts which are widely approved, to which additions may be made to suit different regions of the country, this list being intended for the northern and more eastern States.

It may assist those who have partial plantings, in completing their collections. The earliest sorts are named first, so that with apples the first will be summer varieties, then autumnal, followed by winter sorts, and ending with long keepers. With pears the season will be shorter, or from mid-summer to mid-winter, while peaches and plums will extend only eight or nine weeks.

Apples.—Early Harvest, Red Astrachan, Sweet Bough, Autumn Strawberry, Porter, Gravenstein, Maiden's Blush, Fall Orange, Twenty Ounce, Westfield Seek-no-further, Baldwin, Rhode-Island Greening, Northern Spy, Roxbury Russet. Some will add Early Strawberry, Fameuse, and Golden Russet of Western New-York.

Pears.—Summer Doyenne, Giffard, Rostiezer, Tyson, Washington, Bartlett, Boussock, Seckel, Howell, Sheldon, Duchesse, Anjou, Winter Nelis, Lawrence and Josephine de Malines.

Peaches.—Amsden, Early Louise, Hale, Serrate Early York, Large Early York, Crawford's Early, Crawford's Late and Oldmixon Free.

Plums.—Rivers' Early Favorite, Lawrence Gage, Prince's Yellow Gage, Lombard, Bradshaw, Imperial Gage, McLaughlin, Reine Claude de Bavay and Coe's Golden Drop.

Cherries.—Early Purple Guigne, Governor Wood, Black Tartarian, Coe's Transparent, Early Richmond, Reine Hortense, Rockport, Large Morello. [*Note.*—We place Early Richmond after some other sorts which it is supposed to precede, but its full size and flavor are not reached unless it hangs long on the tree.]

Grapes.—Hartford, Delaware, Wilder, Concord, Diana.

Raspberries.—Doolittle, Mammoth Cluster, Philadelphia, Herstine, Franconia.

Strawberries.— Wilson, Cumberland Triumph, Charles Downing, Triomphe de Gand, Sharpless, Kentucky.

As already remarked, no two cultivators will make the same list, and no one cultivator will make the same list in different years; and some would criticise sharply their own previous selections, if they did not know who made them. The preceding, however, would afford a rich family supply, if growing on good soil and with good management and cultivation.

Stripping Leaves from Plants.—The injury or check to the growth of plants by stripping off the leaves in summer is generally well understood, but corroborative cases are often interesting. An instance is reported in the Farmers' Gazette, as quoted in the Virginia Agricultural Report, where the leaves were all left on a row of corn, and the weight of the crop was 161 pounds, while on a stripped row it was only 88 pounds. In some other cases the difference was less, but distinct and striking in all. The same principle applies to pruning fruit trees in summer, which should be omitted or sparingly performed except where the trees are sufficiently vigorous to bear some check.

Cultivating Orchards.—The oldest apple trees which we know of which continue bearing good crops, are those which stand in the corners of gardens, where they are yearly subjected to rich cultivation through the attention given to garden crops. A correspondent of the Practical Farmer furnishes an example of similar treatment and like results. An orchard was set out in 1816, or sixty-three years ago. Thirty-five trees remain, and they have yielded over $137 worth of fruit in a season. They are moderately pruned every alternate year. Two crops are taken from the ground every five years, and the land is then seeded. The plowing is done in two directions, running as closely to the trees as practicable. All other orchards in that neighborhood planted at the same time, and

allowed to stand in stiff sod, have disappeared. Another writer in the same paper says he kept his young orchard well cultivated with hoed crops for several years. They grew 18 inches to 2 feet in a season. Only one tree died. A neighbor set out an orchard at the same time, and seeded it to grass. In three years one-third of the trees were dead, and those which lived grew only from 2 to 6 inches in a year. This is about the usual experience.

Prof. Beal of Lansing, Mich., says: "If you have money to fool away, seed down your young orchard to clover and timothy, or sow a crop of wheat or oats. If you want the trees to thrive, cultivate well till they are 7 to 10 years old. Spread ashes, manure, or salt broadcast. Stop cultivating in August, weeds or no weeds. This allows the trees to ripen for winter." He adds that the question whether to cultivate old orchards or not, must be answered by manuring the trees. If the color of the leaves is good, and they grow well and bear fine fruit, they are doing well enough, even if in grass. But if the leaves are pale, the annual growth less than a foot on 12-year trees, and the fruit small and poor, something is the matter, and they are suffering for a want of cultivation or manure, or both. Prof. B. says that "to judge of the condition of an apple tree is like judging of the condition of sheep in a pasture. Look at the sheep and not at the pasture, and if they are plump and fat, they are all right."

Trees in Grass.—A correspondent of the Gardener's Monthly, living in New-Hampshire, furnishes an example of a successful orchard, with trees standing in grass. The land was never plowed, the ground being unusually rocky. The trees, however, have been regularly and liberally manured. The writer seems to have overlooked the fact that it is the manure and not the grass that makes the trees bear and grow so well. We have heard of the farmer who found sawdust pudding an excellent feed for his cows; all that was necessary was to add liberally of Indian meal—and, in fact, the larger tke proportion of Indian meal, the more satisfactory was the effect of the sawdust. We are reminded of this anecdote by much that is said in favor of grass in young orchards.

Draining Orchards.—Prof. Ingersoll mentions a successful experiment performed on the college grounds, which shows the importance of draining where trees suffer from a wet subsoil. The trees had become nearly stationary in growth, and yielded little fruit. The orchard was drained by putting a 2-inch tile between the rows, at a depth of 3 or 4 feet. The trouble was entirely remedied. "The trees sprang into luxuriant growth," says Prof. I., "and fruited well. They have done more in two years since draining than in five before."

Some objection was made by a member to draining orchards, on account of the liability of the roots of the trees filling the tiles. The roots of an apple tree near the drain had entirely filled the aperture and stopped the current. Prof. Ingersoll said that experience indicated that the drains could be depended on to remain unobstructed for 15 years, when

the orchardist could afford to clean them out. Mr. Moody said he had a cheap remedy, in cementing the joints with hydraulic cement when laying down the tile. The water still finds its way freely through the porous tiles. He had found that a tile plugged at both ends would fill with water in one minute. Prof. Ingersoll related a conversation he had with an orchardist, who had drains 15 years among his trees before they were stopped by roots. When asked if he intended to take them up and replace them, he answered: "Certainly, sir. I would not be without them for half the value of the orchard." The selection of ground with a good natural drainage was suggested by others.

ENRICHING ORCHARDS.—J. C. Plumb of Milton, Wis., a veteran fruit cultivator, urges the importance of good soil and good cultivation in young orchards. The whole surface should be kept mellow with some hoed crop early in the season, with little or no culture late in summer and in autumn, to favor the ripening of the wood for the cold winters of that region. When in full bearing, the orchard may be seeded to clover, and each successive crop turned under every two years, with a light dressing of manure in the alternate years when not plowed. Buckwheat does well, if left to decay on the ground. One plowing the following May, and harrowing, will give a self-seeding.

GREEN CROPS FOR ORCHARDS.—T. G. Yeomans of Walworth, N. Y., enriches the land of his extensive and successful orchards, by sowing rye in the fall, and when in full green head, plowing under, following with sowed corn, to be plowed under late in the season.

THINNING FRUIT.—An orchardist who makes his trees bear a moderate crop every year, of larger and finer fruit than when crowded, gives the following directions for doing the work: A light ladder is used to give ready access to any part of the tree. The branch is held in the left hand, while with sheep-shears in the right, every bunch of apples is cut off, leaving a part of the stem of each fruit. This is done as soon as the blossoms have fallen, and before the young fruit has attained any size. When this branch is entirely cleaned, the next branch is skipped, and the third cleared of the fruit like the first, and so on until every alternate branch is divested of its fruit. This work is not done on the small limbs here and there over the tree, but on main branches, and equally on both sides of the tree. Of medium sized trees, an active man will go over fifteen or twenty in a day.

CEMENT FOR PRUNING.—Dr. T. H. Hoskins of Vermont, who has had much experience in orchard management, finds the following composition for a cement to encase wounds made by pruning, the best he is acquainted with: One quart fine North Carolina or pine tar is to be boiled slowly for three or four hours. Add to the boiling tar four ounces of tallow and one pound of beeswax, and stir all till well mixed. Remove the vessel from the fire, and stir the contents till partly cooled. As soon as the cement begins to thicken, stir in a pound of powdered and sifted clay,

previously prepared. Stir till nearly cold, to prevent the clay settling. In summer, this cement is just soft enough to be easily spread with the point of a knife. It excludes moisture, and does not harden or crack. The boiling of the tar is necessary to drive out the turpentine. This application is similar to, but better than the simpler mixture of pine tar and brick dust, which we employed many years ago for the same purpose.

Liquid Grafting-Wax.—This, if properly made, may be readily applied to out-door grafting, without the trouble of heating, and it is also a good application to wounds made in pruning. The following directions are given by W. W. Tracey: Melt a pound of resin with a pound of tallow, and when mixed, remove from the stove and allow it to cool till a scum begins to form. Then add a teaspoonful of turpentine. Replace on the stove, and add seven ounces of a mixture of two parts of alcohol and one part of water, stirring briskly, and taking care that the alcohol does not burn, as it will if too hot. Stir till of the consistence of honey; keep corked, and apply with a brush. If it gets too hard, re-melt and apply a few drops of turpentine, and of alcohol and water. It hardens after applying.

Trimming the Roots of Seedlings.—Peter M. Gideon of Minnesota remarks that in the early days of his horticultural experience, he was "crazy" to secure all the little fibres, even on his seedlings used in root-grafting. He has now got over all this, and he finds the cleaner the seedling roots are of fibres, the better they will grow, by sending out new tender rootlets. With orchard trees he wants all the roots he can get, but it is not at all essential to secure the growing points.

Rabbits and Mice.—A western paper says that common straw paper tied around the trunks of trees, and painted with tar, or with lime wash mixed with a decoction of tobacco, is the safest and easiest repellant of rabbits and mice. Fresh blood will repel rabbits, but is very attractive to mice.

Profitable Orchards.—J. W. Gray of Orleans County, N. Y., reported at a horticultural meeting at Rochester, about a 14 acre orchard at Albion, 8 acres of which were 50 years old, and 6 acres 30 years old, the apples from which sold in 1867 for $3,000, and in 1869 for $2,000. For several years before, it averaged $1,600 a year. In 1878 it bore 940 barrels. The sorts are chiefly Baldwin, Greening, Spitzenburgh, Roxbury Russet and Tompkins King. The land is plowed and cropped alternate years, and a load of manure applied every third year to each six trees. Mr. Gray's own orchard of 12 acres, on soil with natural drainage, is plowed shallow very early each spring before the buds swell, harrowed occasionally till July, and sheep and hogs kept in through the season. He had in 1878 400 barrels of choice fruit scarcely affected with the codling moth.

Oil on Young Trees.—The editor of the Gardener's Monthly gives

the successful result of the use of linseed oil in destroying the scale on his apple and pear trees, which were badly infested with it. Other cases are reported to him where oil killed the young trees. He inquires why the results should be so different. Doubtless if the time of year when the application was made, and the condition of the bark, were stated in these several instances, the case would be a plain once. Oil applied while the trees are dormant will generally become dry, hard and harmless before the leaves expand and growth commences, and no harm will be done. Or, applied to the rough exterior of trees several years old, it will not penetrate to the green bark. It appears to be particularly fatal to young peach trees.

The same paper gives a statement from G. R. Dyckman of Shippensburgh, Pa., of his experiments in applying oil to the trunks of fruit trees —a practice which has been strongly recommended by some for its beneficial effects, and among others as a protection against pear blight. Mr. D. applied oil to 600 peach trees, 200 apple, several pear and plum trees, and 100 quince. All the peach trees, five years planted, were killed; the other trees were not injured. Other peach trees were painted with refuse lard and linseed oil, and these are all dead. The object in greasing was to keep the rabbits off. Oil is sometimes applied for the white scale, and these experiments show the necessity of discrimination and caution, and the importance of trying doubtful experiments to a moderate extent.

Apples for Pennsylvania.—The Secretary of the Pennsylvania Board of Agriculture received a large number of responses to his questions to fruit-growers in that State, asking each for the names of the three best or most popular or profitable apples. The result was that the Early Harvest, Red Astrachan and Sweet Bough had the highest vote for summer sorts; Maiden's Blush, Rambo, Smokehouse, Queen and Fallawater, the highest for autumn; and Baldwin, Rhode-Island Greening, Northern Spy, Smith's Cider, Roxbury Russet, Tompkins King and Seek-no-further for winter.

For Wisconsin—The Wisconsin Horticultural Society gives the following lists of apples for that State: For extreme hardiness only—Tetofsky, Duchess of Oldenburgh, Haas, Plumb's Cider and Fameuse. For general cultivation—Tetofsky, Duchess of Oldenburgh, Haas, Plumb's Cider, Fameuse, Walbridge, Red Astrachan, Utter, Westfield Seek-no-further, Ben Davis, Tallman Sweet, St. Lawrence, Willow Twig and Pewaukee.

For Minnesota.—Most of our readers are doubtless aware that the fruits regarded as quite hardy in most of the Northern States, cannot endure the winters of Minnesota. A special list must therefore be made for that State, and we have occasionally given the names of such fruits as succeed there. The following list is furnished by J. H. Harris, an experienced orchardist of that State: Duchess of Oldenburgh, Tetofsky, Plumb's Cider, and Fall Queen or Haas. Red Astrachan and Fameuse

are not hardy enough. Late Strawberry will scarcely answer. Ben Davis, Gravenstein, Rambo, Fall Pippin, and Maiden's Blush, although hardy in some cold localities, fail in Minnesota.

For Iowa.—The Iowa Horticultural Society has adopted the following list of apples for general cultivation in that State: For Summer—Tetofsky, Oldenburgh, Red Astrachan, Benoni, and Early Joe, top worked. Autumn—Maiden's Blush, Chenango Strawberry, Bailey's Sweet, Dyer, Gros Pomier, Fameuse, Fall Orange, Lowell, Porter, Utter's Red, Wealthy. Winter—Jonathan, Tallman Sweet, Rawle's Janet, Iowa Blush, Ben Davis, Willow, Walbridge, Lansingburgh.

For Missouri.—Missouri orchardists recommend Ben Davis as the best for profit, and Smith's Cider next. Rome Beauty is strongly commended. The Lawver promises well in that State, but is too small and poor in New-York. Rawle's Janet and Winesap are good apples in Missouri. Smith's Cider has been found to pay well in Pennsylvania, where one man at New-Hope received $2,000 from his crop of this sort.

Assorting Apples.—H. E. Hooker of Rochester stated recently, at a meeting of the Western New-York Farmers' Club, that his method is to gather his apples the first of October, and the pickers bring them in the baskets and empty them carefully on a long table, where they are conveniently assorted and put into barrels. These are placed in a cool place, north of a barn, and removed to a cold cellar as the weather reaches freezing. For marketing, careful and uniform assorting is essential.

Hardy Fruits for Iowa,—The Prairie Farmer gives the following selection of hardy fruits for Central and Northern Iowa, made by Prof. Budd of the agricultural college of that State. For summer apples he names Tetofsky, Oldenburgh and Saxton; for autumn, Plumb's Cider and Fameuse; for winter, Wealthy, Walbridge and Iowa Russet. The only cherry tree that proves satisfactory is the large English Morello, planted deep enough to throw out its own roots, which is much better than to stand on the more tender mahaleb and mazzard stocks.

Raising Seedling Peach Trees.—It is well known that certain varieties of the peach, especially the yellow-fleshed sorts, vary but slightly from the parent peach when raised from the stone. Others vary more; but in doing so, occasionally give valuable fruits. The Amsden and Alexander, raised from the Hale, are examples. It is worth the trial for those who have the ground to spare, to devote some space to seedlings, and they can hardly fail to obtain some good fruit. About fifty years ago, David Thomas procured a quantity of peach stones from an orchard planted with several of the best sorts. These were planted in a row about 50 yards long, and a foot apart. They grew and bore. Several proved rather poor in quality; many were good enough for use on the table, and a few were really excellent. Among the latter was the White

Imperial, which originated in this row of seedlings. A more general practice of raising seedling peaches would doubtless result in a great improvement in our list of varieties.

ENDURANCE OF PEACH BUDS.—It is well known that under ordinary circumstances the fruit-buds of the peach will mostly perish with a temperature of 12° below zero. Under favorable conditions they will survive a more intense cold. One of the most important of these conditions is produced by continuous cool weather previously, preventing the swelling of the buds. Another is the very brief continuance of the cold; and a third is shielding them, after the cold snap, from the morning sun. With these conditions a portion of them frequently escape a temperature of 16° or 17° below. At a meeting of the Lucas County (Ohio) Horticultural Society, Mr. Hefflebower said that only the more tender varieties had been killed in the winter, although the mercury fell to 19° below zero. The reasons given were the excellent ripening of the wood in autumn, and the absence of previous sudden changes of the weather

PEACHES IN GEORGIA.—The peach appears to be the great leading fruit in Georgia for market. P. J. Berckmans says that immense quantities have been shipped to northern markets, with generally very satisfactory results. At a meeting of the State Horticultural Society, many collections contained from 40 to 60 varieties, ripe and in good condition. The society recommends the following sorts: Alexander, Amsden, Beatrice, Hale's Early, Fleita's St. John, Tillotson, Mountain Rose, Chinese Cling, Early Crawford, Gen. Taylor and Duff Yellow. The last two are large and highly colored early clingstones.

CROWDING VINEYARDS.—In proof of the well-known fact that strong growing sorts are injured when not allowed ample space, Mr. Winchester of St. Joseph, stated that a single vine extending 50 feet on a trellis yields more grapes than the same length of trellis, covered with vines planted 8 feet apart. In the report from Ingham County, W. A. Rowe says the best vineyard he ever saw was planted 8 by 12 feet, and every alternate plant was to be taken out in three or four years.

COVERING GRAPEVINES.—There are three modes employed in covering vines for winter. One, which must be performed before the ground freezes, is to lay them down, and place on them 2 or 3 inches of soil. This does well if the soil is not too clayey, the winter not wet, and the vines well ripened. Otherwise there is danger of rotting, and merely laying them on the ground may be safer, as they will be more or less covered with snow, and be less exposed to the wind than if left on the trellis. If this does not afford sufficient protection, a perfectly safe covering is made of the branches of evergreen trees. To hold the vines down we find nothing so convenient as sticks of stove wood. Vines are more or less benefited every winter by laying down, as a very hard freezing more or less affects their vitality and lessens their vigor in early spring.

KEEPING GRAPES.—Every year we have some new process presented

to us for keeping grapes fresh in winter, each being a variation of the old way. It is well for those who are packing their grapes for winter, to keep in mind the essentials for success, and to vary the non-essentials according to circumstances. Standing first as indispensable, the fruit should be well-grown and well ripened. Matured rich juice will keep the bunches far better than if green and watery. But this is much better understood now than in former years, and better cultivation is now generally given. The next requisite, and also indispensable, is to place the fruit in a cool, dry room. If it is well matured, it will not freeze at several degrees below 32° Fah. It will not endure long in a warm temperature. These are the two great essentials. The materials in which the grapes are packed are of secondary importance. Baked sawdust is excellent, because being a non-conductor of heat, it preserves a uniform temperature; and absorbing moisture, it keeps the fruit dry. Soft straw, chopped an inch long, is a good material to pack in, and is more easily freed from the berries. Dry maple leaves answer a good purpose. Cotton batting does well, if previously well dried. A damp room should be avoided, as it would cause mould. Waxing the ends of the stems amounts to little, as the moisture is absorbed or given off all along the sides.

The following mode, described by E. F. Guild of Saginaw, Mich., will be new to most of our readers: The grapes are picked on a dry day, and placed in stone jars, in alternate layers with soft paper or any other absorbent to keep the fruit dry. Dig a trench in a dry spot, 8 inches deeper than the tops of the crocks when set in, and cover them loosely with a board till the ground begins to freeze. When it has frozen the earth to the depth of 4 or 5 inches, put on mulch or coarse manure to keep out frost. The jars are easily taken up one at a time through the winter. Mr. G. says if they were buried deep in the earth, they will keep till grapes come again, but he does not say he has tried it.

Fruits for Kansas.—At a recent meeting of the Kansas State Horticultural Society, the following fruits were generally reported as doing well: Early Richmond cherry, Wild Goose plum, Blackcap raspberries, Kittatinny blackberry and Concord grape. Many of the other sorts have proved failures in that climate.

Materials for Mulching.—Prof. Beal gives, in the Rural New-Yorker, the results of several experiments to determine the best materials to mulch strawberries and other plants, and arrives at the conclusion that the best is chopped straw. He finds a thick coat of manure excellent for bedding plants. He tried old clover hay, and had a fine crop of clover plants to kill the next spring. Hay gives a similar result in a young crop of grass. Straw badly threshed, furnishes in the same way a young grain crop in the garden. Forest leaves held down by cornstalks, gradually blew away during winter, and the cornstalks alone remained in the spring after an open winter. Pine shavings worked into the soil, and proved a nuisance. The same objection existed with tan-bark. Clean straw, old

or new, or corn-fodder cut two inches long, less or more, answered the best purpose.

PRUNING CURRANTS.—Some writers have recommended pruning currants in summer, when in active growth. At that time the pruning would of course check the vigor of the bushes, which is not often needed, as it is rare that currant bushes grow too fast. They more usually need pushing into more rapid growth. Prune them early in spring; cultivate and manure the ground, and cut out old, crooked and stunted wood. Old and feeble bushes may be thus made to bear larger and finer fruit. If instead of one single stem to each bush, there are several, they will be likely to do better in our climate.

ROTATION FOR STRAWBERRIES.—J. N. Stearns of Kalamazoo, Mich., said he had learned from experience that a second planting of strawberries after a previous one, always resulted in a diminished crop. Even where the plants grow freely the fruit will be poor. Thos. Wild of Berlin said that from much experience he had found that a single full crop of berries is all that a piece of land will profitably grow without a period of respite. There should be several intervening years with other crops. Clover immediately following, pastured, and finally turned under, brings the land into good condition for a second planting. Strawberries are exhaustive, and wheat after them is generally a meagre crop.

CARE AND NEGLECT.—Judge Ramsdell of Northern Michigan says that one of his neighbors raised seven bushels of strawberries on four rods of ground (280 bushels per acre), while another had only three bushels from fourteen rods (34 bushels per acre). Both were set out at the same time, with the same variety, and treated alike, except that the first was heavily mulched with compost in the fall and again in the spring.

ORNAMENTAL RASPBERRIES.—A writer in a horticultural paper thinks that a neatly pinched in and handsomely trimmed bush of the Mammoth Cluster raspberry, when loaded with a crop of its bright red unripe berries, mixed with the shining black ripe ones, the whole relieved with its light green foliage, is as ornamental and attractive as a rose bush in full bloom.

DRYING RASPBERRIES.—A correspondent of the New-York Tribune says there is no kind of dried fruit in such brisk demand in market as raspberries, and that it is quite as profitable to dry as to sell fresh. One hundred quarts will make 30 pounds, which at 30 cents per pound, gives 9 cents per quart for the fresh fruit, less half a cent, the cost of drying. The Blackcap is here alluded to, which he states is the most hardy, reliable, and easily grown of small fruits.

CANNING FRUIT.—It was stated by C. A. Green, at a Rochester Horticultural meeting that in Cincinnati there were canned in 1877, 100,000 cans of strawberries, 99,000 of blackberries, 268,000 of raspberries, and 672,000 of jellies, besides apples, peaches, plums, cherries, &c. The amount of small fruits paid for and consumed in the United States yearly

was estimated at $25,000,000. The small fruits raised in Michigan were estimated at 2,795,000 bushels, amounting to at least $5,591,000.

CELLARS in winter need special attention to preserve perfect cleanliness, on many accounts. Fruit rooms, by the help of ventilating windows and a thermometer, should be kept as well down towards freezing as practicable, to prevent rotting, and to favor long keeping.

THE VEGETABLE GARDEN.

MATS FOR HOTBEDS.—W. D. Philbrick, of Middlesex County, Mass., sends to the COUNTRY GENTLEMAN the following directions:

"The best mats are made hereabout in a frame like the cut, (fig. 227,) standing on legs about 3½ feet from the floor, so that a man can stand at one side to tie the strings. Rye straw is best, and should be cut a little green, and good, clean, long straw selected for the purpose. The strings are tarred spun yarn, or marline, and can only be drawn tight in cold weather in a room kept warm by a stove, as the tar is too stiff in the cold. The mat should be about 4 inches longer across than the length of the sashes; thus a 6-foot sash will require a mat 6 feet 4 inches wide. The mats are generally made 6 to 8 feet in length. A 6-foot 4-inch mat should have at least eight or (better) ten strings. The strings are cut about 5 feet long to begin a mat, and laid across the top of the frame in their places; the boards should be notched slightly with a saw at the points where the strings come.

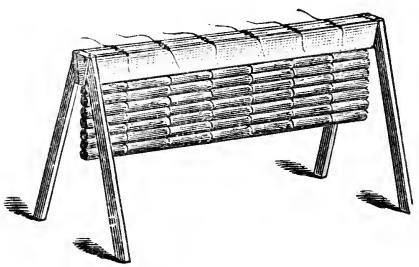

Fig. 227.

"The man takes two small handfuls of straw, and lays them smoothly on the strings with the heads inward, and ties them firmly down with a half weaver's knot. If the straw is long and good, it will lap enough in the middle of a 6-foot mat to make it even in size entirely across; but if the straw is a little short, a small handful will need to be placed in the middle of the mat to fill it up evenly. When the strings have all been tied down, the man cuts off the buts of the straw with a knife or hatchet, so that the tied bunch will slide down between the two boards which make the top of the frame, and repeats the process until the mat is long enough, when he ties it off with a full knot."

STRAWBERRIES AND POTATOES.—The London Garden gives the following mode by which a strawberry bed was planted in connection with early potatoes, with success: Beds extending across the garden, 4 feet wide were planted in spring with strawberries. On the outer sides of these beds three rows of early potatoes were planted. The potatoes were dug about the end of June, the ground cleared and raked level, where the strawberry runners could establish themselves and form a new row. The next spring, rows of potatoes were planted, one row farther off, or on the borders of the runners. The gardener thus made a traveling strawberry bed, which became wider each year without planting. The third year, the first plants were exhausted and were dug up, the bed thus moving slowly sidewise.

GREEN PEAS.—G. W. Campbell of Delaware, Ohio, gives the Practical Farmer a brief statement of his mode of raising peas, which accords with that adopted by some other successful cultivators. For a succession he formerly planted two weeks apart; but the late plantings had small crops and mildewed pods. He now plants all at a time, and as early as the season will permit, using early and late varieties. When planted deep the plants continue longer in bearing, and endure the drouth. He plants early sorts 6 inches deep, and late ones rather deeper. For this depth the soil should of course be loose and porous. His earliest is Carter's First Crop; the latest, Champion of England.

J. C. Weston of Bangor, Me., says that after a trial of 20 years he finds the following method of raising peas in small gardens the most profitable and satisfactory: A warm sheltered situation is selected and trenches are dug about 1½ feet wide and 3 feet apart; the bottom is filled with old manure which is covered with loam. The soil being light, he then sows the peas and covers them 6 inches deep with soil. After the first hoeing, the sticks are inserted for their support. The manure imparts great vigor to the plants, the depth of covering prevents the effects of drouth and the bed furnishes peas for nearly a month.

ONION CULTURE.—The Prairie Farmer sums up briefly and gives the following requisites for the successful culture of onions: High manuring, a perfect tilth, smoothness of surface, early and thick seeding in accurate drills, an early use of the weeding cultivator between and as close to the rows as possible, thinning the crop as soon as it begins to fill the drills, and the removal of superfluous plants at the second weeding, will insure success, and that at a minimum cost; and, above all, at a profit to the cultivator.

TOMATOES IN A GREENHOUSE.—An English journal mentions the successful experiment of raising tomatoes in a greenhouse, which are expected to furnish ripe fruit about the first of June. The plants grow in narrow beds on each side of the span-roofed house, and are trained up on wooden laths.

TESTING SEEDS.—The Gardener's Magazine gives in substance the

following easy method of testing turnip seed: Place on a dinner plate a circular piece of white flannel, just large enough to cover the lower part. Mix the seeds well together, so as to give a fair sample, then take up a portion of the seeds in a small spoon, place them on white paper for counting, and note the number. Spread them evenly on the flannel; then saturate it with cold water, but not cover it, and let the seeds remain thus exposed to air and light for a few days on a table before a window on the sunny side of the house. The good seeds will swell, germinate, and throw out long, slender white shoots. Count them, and ascertain how many are good. When you plant the seeds, if they do not come up as well as these, then you have either buried them too deep, or else sown them on hard, cloddy, or dry ground.

Sowing Peas in Autumn.—A writer in the London Garden says he always sows his peas in November, and by rolling the seeds in red lead, the mice do not touch them, when they appear in spring a small coating of coal ashes wards off the slugs.

Making Plants Hardy.—Nothing contributes more to rendering plants hardy, for enduring the sharp cold of winter, than a dry bottom. In the first place a dry soil induces an early ripening of the wood, and we have known this early ripening to make more difference than 20 degrees in temperature. A wet soil causes a late and watery growth, which is easily winter-killed. In the second place, trees and plants standing in a soil not soaked with water, will bear greater cold than the same trees water-soaked at the roots. It is well always to bear these facts in mind, and to act accordingly.

Keeping Cabbages.—The Iowa Register says that the practice adopted at the East, of placing cabbage heads upside down in a trench, and covering with earth, or with straw and earth, does not succeed in Iowa. The best way therefore is to cut a trench about two feet deep, in a dry spot, place a pole lengthwise over it, and suspend the cabbages, roots up, to the pole, the heads not touching the ground; then covering with straw and earth, they will keep well till spring. They will of course bear some freezing.

Blanching Celery with Tan.—The London Garden gives the practice of a successful cultivator, who uses old spent tan for earthing up. It keeps the plants free from slugs, and from the severe frosts of winter, board or slab covers throwing off the water.

Irrigating Gardens.—The Prairie Farmer describes an experiment by which a quarter-acre garden was easily irrigated, promoting the vigorous growth of vegetables, especially celery, and also cauliflower, cabbage and other succulent plants. The plants being in rows, light furrows were run between them and water poured in to reach the roots. When well soaked, the earth was thrown back and covered the wet soil. The work was done with a narrow "bull-tongue," fixed to a low frame with a wheel, used for cultivating by hand between rows. This left the bottom of the

furrow loose, and it readily absorbed the water. The object of this mode was to make a moderate quantity of water go a good way, by applying it directly to the roots.

IMPROVING EARLINESS.—A correspondent of the Tribune says that for twelve years past he has always selected for seed of the Lima beans those which are largest and first ripe. When he began this series of selection, the beans did not become large enough to eat till the 8th or 10th of September; now they are fit for eating on the 8th of August. He has pursued with success the same course with marrowfat beans.

REMEDIES FOR INSECTS.

BOYS AND BUGS.—An efficient mode for clearing destructive insects from small crops might be more extensively and profitably resorted to in the employment of boys to gather them, paying for the hundred, or measure. Those who have a quick eye and ready fingers will reach them more easily and do more than men. Try the experiment early in the season, when "potato bugs" appear, and give them a specified sum per quart. In the same way they will keep clear a patch of cucumbers or squashes, using a pan with a thin coat of molasses in the bottom to secure their prey. We discovered, many years ago, that the white grub was destroying a valuable plantation of seedling pears. Fifty cents per hundred to a few young boys brought them in, and as the insects became scarce, a double and quadruple price produced a wild excitement among the little fellows, and every straggler was cleared. The sum paid was small; the saving of the crop was of great value. The same remedy may be applied to the green cabbage worm, and when they are not numerous, the riddance is easy.

WATER AND TAR.—A correspondent of the Chicago Tribune says he has not for five years lost a cucumber, melon or cabbage plant, his remedy being to pour water into a barrel which contains a few quarts of gas tar, which impregnates the water, and this is applied with a garden sprinkler. If the rain washes it off, he repeats the application. He also asserts that it will destroy or repel the Colorado potato beetle.

HOT WATER.—It is worth while trying hot water on the currant worms and on the green cabbage worm. Take a thermometer with you, so that when you get the right degree of heat you may get it right again, as well as tell others intelligibly. It is well to try which is best—quite hot water dashed on for half a second only, or water at a lower temperature, showered on longer from the watering pot. Suppose that you actually spoil half a dozen cabbage plants, or the leaves of two or three branches of a currant bush; the knowledge you get will be likely to be worth a hundred times as much. A little practice, however, will enable any one to know just how long to let it run before hurting the cabbage leaves, by trying it on

a few of the poorer plants. We see a modification of this remedy mentioned in an agricultural paper, by heating the water to 130° by the thermometer, and adding a small handful of salt to each gallon of water, allowing it to run about four seconds. The salt is probably of little use. Water, if much hotter, must be applied very briefly, or with a dash.

P. C. Dempsey of Albury, Ontario, Can., says that water with a temperature as high as 200° may be used to destroy cabbage worms, and that it will not injure the cabbage. It is applied through a rose sprinkler. It is said that a cold infusion [decoction] of quassia, three pounds to a barrel of water, has been found effectual, and is more convenient to apply than hot water. The cabbages must be thoroughly washed from it before using.

PARAFFIN OIL.—The London Garden says that three wineglassfuls of paraffin oil to four gallons of water is instant death to bugs, without the least injury to tender plants. He puts the oil first into a pot, and then fills in the water vigorously with a syringe. In applying it, one man is kept lifting a syringeful out of the mixture and discharging it into itself, while another applies it to the plant. In two or three minutes it is syringed off again with clean water.

REPELLANTS.—We always prefer the remedies which promptly kill insects to those which simply attempt to repel them; nevertheless the latter answer well sometimes. It is stated that water in which a little gas tar has been placed for a time will drive off the striped cucumber beetle, as well as lime dust, ashes or soot. Prof. Lazenby found a thin mixture of Paris green in water to be efficacious, but he prefers square boxes around the plants. He tried various remedies for the cabbage worm, but a solution of one pound of whale-oil soap in four gallons of water answered best.

CATCHING CURCULIOS.—One of the best contrivances for jarring down and catching curculios, is a broad hopper on a two-wheeled barrow, the hopper being a light frame covered with oil-cloth. The advantages possessed by the oil-cloth are that it does not become wet with the dew of cool mornings, and being smooth, the insects roll down it freely into a tin reservoir at the bottom. A slit on one side of the hopper admits the trunk of the tree. The operator, with a long-handled mallet, strikes the several limbs, and jars down the insects. A defect in this catcher is that the mallet is padded so as not to bruise the bark, and this so softens and enfeebles the jar, that only a part of the curculios fall. Hence its inefficiency. The right way is to bore a small hole, about three-eighths or half an inch in diameter, into the trunk of the tree, or into each limb if the tree is large, and insert into each of these holes an iron plug, made by cutting up an iron rod. The mallet is to consist of a pole of suitable length with an iron knob at the end. This knob is struck forcibly against the iron plug by means of a forward thrust, and the sharp jar thus given brings down all the insects. This mode of jarring the tree should be

employed in all cases, and is more rapid and more effectual than the padded mallet. Wide "factory" sheets, stiffened with light frames, answer well for catching the insects, and they are rendered more effectual and durable by oiling.

THE CABBAGE WORM.—At the Montgomery County (Ohio) horticultural meeting, M. D. Egbert said he had found warm soap-suds a complete remedy for the cabbage worm. Mrs. Ramsay said that at a temperature of 125° the cabbages would not be injured. Mr. Broadwell had found common soap-suds a perfect remedy if applied while the worms were small, and early in the morning,

THE CURRANT WORM.—A writer in the Tribune thinks it important to dust the hellebore on the underside of the currant leaves, where the worms feed, and where it will not be washed off. He takes thin cotton cloth, that the powder will pass through sparingly, about ten inches square, encloses the powder, gathers the corners and sides, and ties around the end of a stick three or four feet long. The bushes are opened early in the morning, and the dusting is done upwards or sidewise, the wind, if any, assisting.

THE CUCUMBER BEETLE.—A writer in the Rural New-Yorker says that he has successfully repelled the insect commonly known as the striped bug by applying ashes soaked in kerosene. A handful is applied at the centre of each hill. Its strong odor compels them to beat a retreat.

INSECTS ON HOUSE PLANTS.—The Scientific American gives in substance the following mode of destroying insects on house plants: Place the pots on a table or platform on which there is an inch or two of sand. Cover them with any inverted vessel, the sand making the edges fit closely. Or place over them a light frame or support, and cover them with a cloth. Then burn tobacco under the cover, and let the smoke remain fifteen minutes. This is better than syringing, because the smoke penetrates every corner and crevice. The same journal states that when the open soil is infested with insects, caused by a free use of fertilizers, a good remedy is to cover it when dry with a fourth of an inch of soot, and water liberally, which kills the insects and leaves the plants.

DESTROYING THE GREEN FLY.—An Illinois correspondent of the Gardener's Monthly states that the green fly attacked his plants in the dwelling-house where tobacco smoke could not be used. He procured a handful of lady bugs and placed them on the plants one evening. The next morning not a green fly was to be seen.

PLANTS IN FLOWER POTS.—The use of mustard water for repelling or destroying insects in the soil of flower pots, has been recently recommended—a tablespoonful of mustard to a gallon of water. A greater degree of strength would probably be more effectual; pungent vegetable matter not injuring plants.

INSECTS ON ROSES.—When it is not practicable to employ the disagreeable fumes of tobacco, which otherwise are the best remedy for

insects on the rose, Ellwanger & Barry adopt the following: Boil 4 ounces of quassia chips 10 minutes in a gallon of soft water, and after straining add 4 ounces of soft soap, which should be dissolved as it cools, stirring well before using. With a small, clean painter's brush, apply it to every infected leaf and shoot. In 15 or 20 minutes wash the plants with pure water. Tobacco may be used instead of the quassia. For some insects a sprinkling of powdered white hellebore will destroy or disperse them, the plants being previously well moistened. The rose caterpillar, which glues the leaves together, must be killed by pinching between the thumb and finger.

THE ROSE-BUG.—Peter Henderson gives in the Gardener's Monthly, some interesting statements on the habits of the rose-bug. John May of Madison, N. J., after years of perseverance, has entirely cleared his plants, and his roses are now perfect models of health and vigor. He finds that no substance will destroy the insect in the larval state without injury to the plant. They feed at the roots, and when symptoms of their presence are observed, the only course is to dig up the plants by the roots. The symptoms are weak growth, pale shoots, and few or no flowers. But the remedy is to destroy the perfect insect under the leaves, always fewer in number than the grubs; their presence is not commonly observed by those who only view the leaves from above. They crawl down and deposit their eggs at the roots.

ROSE SLUG.—A correspondent of Colman's Rural World gives the following mode for destroying slugs on rose bushes: I have a considerable number of roses in my garden, which, during the last two summers, have presented as fine an appearance in leaf and flower as they did before the advent of the rose slug. Their healthful condition was produced by the prompt use of powdered white hellebore, prepared in the following manner: One tablespoonful steeped in hot water for ten minutes, diluted in five quarts of cold water, and applied through a syringe or fine rose of a watering can to the foliage while still moist with dew. Two applications three or four weeks apart, will effectually repress the slug each season. Four ounces of hellebore per annum will keep one hundred plants of average size in good condition. Of course hellebore should be used with caution, as it is an active poison.

APPLYING WHITE HELLEBORE.—A successful manager uses the following to destroy the rose slug, which mixture does not injure the plants: Add to a pail of water, half a pint of soft soap and four ounces of white hellebore. Throw it on the under side of the leaves every morning with a garden syringe. Watch for the insects in June and August. The soap assists in the adhesion of the mixture to the leaves, and as the insects work on the under side, the syringe applies it where wanted.

DAMAGE BY INSECTS.—The annual products of the soil in the United States are estimated at $2,500,000,000. Of these at least $200,000,000 are yearly destroyed by insects. Yet some of the most wealthy States can-

not afford a thousand dollars or two, as salary to an entomologist to study the habits of these destroyers, and to furnish the most expeditious methods for saving the crops!

DOOR-YARD PLANTING.

THE ACCOMPANYING PLAN for a village lot (fig. 228) was furnished by a correspondent of the COUNTRY GENTLEMAN, and was intended to give those not familiar with designing and laying out grounds, distinct and specific directions what trees to select, and where to plant each one, and where to place the several flower beds and the shrubbery. The letters upon the plan correspond with the same on the list of trees and plants :

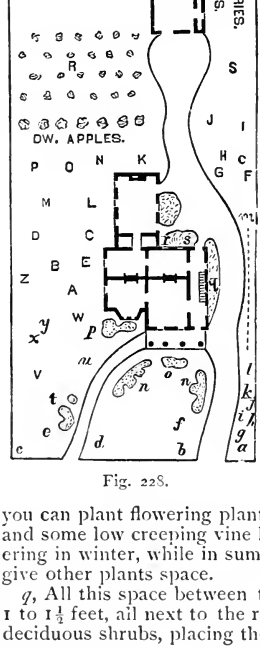

Fig. 228.

a, Purple-leaved maple.
b, Norway maple.
c, European sycamore maple.
d, Cut-leaved maple.
e, Red or scarlet maple.
f, Double-flowering horsechestnut.
g, Imperial cut-leaved alder.
h, White-flowering dogwood.
i, Magnolia purpurea.
j, Mahaleb cherry.
k, Magnolia glauca.
l, Pavia whittleyi or purpurea.
m, Hedge of Siberian arbor vitæ, or of hemlock.
nn, Beds to be filled with ever-blooming roses, geraniums, and other brilliant summer-blooming plants. In winter to have branches, or small trees, of evergreens placed in the ground, the tallest in the centre of the beds, toning every way toward the surrounding turf.
p, Plant this bed with hyacinths, crocus, tulips, lilies, &c.; in a word, with flowering bulbs. In planting, do so at different times with each class, unless it be lilies. Leave also spaces into which at any time you can plant flowering plants for the season. Use more or less of vinca, and some low creeping vine like Juniperus prostrata for border and covering in winter, while in summer the vines may be trained where best to give other plants space.
q, All this space between the road and house (leaving a turf border of 1 to 1½ feet, all next to the road), plant with varieties of hardy-flowering deciduous shrubs, placing the strongest in the rear of the bed, containing,

if correctly done, a rise from one foot next the road all around toward the house and centre of the plat.

r, Purple fringe tree.

s, Varieties of barberry; and after the plants are established let turf grow over the plat.

t, Bed to be filled with perennials and annuals, such as phlox, milfoil, columbines, spireas, daisies, bocconia, buphthalmum, campanulas, larkspur, dicentra, iris, poppy, etc., and annuals to suit.

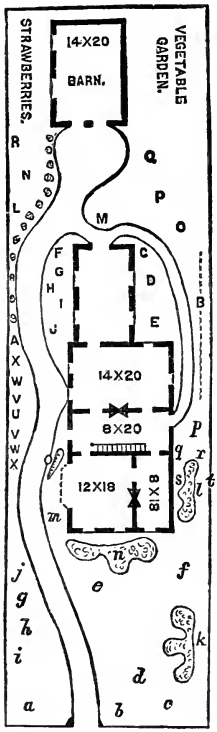

Fig. 229.

u, Cut-leaved weeping birch.

v, Purple-leaved beech.

w, Cembran pine.

x, Corsican or yellow pine.

y, American white spruce.

z, American black spruce.

A, Lawson's cypress.

B, European silver fir.

C C, Norway spruces.

D, White pine.

E, Red bud or Judas tree.

F, Shad blow or June berry.

G, Strawberry tree or burning bush.

H, Early Richmond cherry.

I, Black Tartarian cherry.

J, Rockport cherry.

K, Red Jacket cherry.

L, Early purple Guigne cherry.

M, Elton cherry.

N, Louis Phillipe cherry.

O, Coe's Transparent or Elliott's Favorite cherry.

P, Black Hawk or Pontiac cherry.

R, Twenty-seven Dwarf pears of varieties 8 feet apart each way.

S, Peach trees, eight in number.

Another design for a smaller lot is given in fig. 229. The positions of the trees are given in the following list:

a, Mahaleb cherry or magnolia glauca.

b, Norway maple or double-flowering horse-chestnut, or common chestnut, or linden, or butternut, or a French or Spanish marron.

c, American beech.

d, European flowering ash.

e, Cut-leaved weeping birch.

f, American white or black spruce, or Austrian pine.

g, Sassafras or ever-flowering weeping cherry, or June berry, or shad blow, or hop tree, or double-flowering plum, or purple fringe tree.

h, Red bud or strawberry tree.

i, Lawson's cypress or Cembrian pine.

j, Magnolia purpurea, or gracilis.

k, Group of dwarf flowering shrubs, such as spireas, deutzias, Japan

quince, Forsythii; mingling dwarf arbor vitæ and junipers, so as to make the group good in winter. When planting set the lowest near the front, and on the points of the bed.

l, Snowball, wiegela rosea, alba and Desboisii, sweet-scented shrub, white fringe, Stuartia, some one variety of elder, hydrangea paniculata flore pleno, upright or Tartarian honeysuckles. All these plants want clipping back directly after having bloomed, one-third of the year's growth, together with all the year's seed vessels. In this way the group may be kept with the white fringe as a centre, and a fall every way from it.

m, Halesia tetraptera or snow drop tree.
n, Bed of perpetual roses, geraniums, verbenas, &c.
o, Bed for bulbs of sorts.
p, Hemlock.
q, Siberian arbor vitæ.
r, Chinese arbor vitæ.
s, Weeping arbor vitæ, var. filiformis.
t, Weeping juniper.
U, Tom Thumb arbor vitæ.
V V, Juniperus nana.
W W, Juniperus japonica.
X X, Juniperus sabina.
A, Juniperus prostata or repens.
B, Row of raspberries.
C, Row of gooseberries.
D, Dwarf apple trees.
F to *J*, Dwarf pears.
L, Rockport cherry tree.
M, Black Tartarian cherry tree.
N, May Duke or Louis Philippe cherry tree.
O, Red Jacket cherry.
P, Standard Bartlett pear.
Q, Standard Seckel pear.
R, Red Dutch currants.

All the ground in the rear of the back line of the house may be used as a vegetable or kitchen garden.

EXPERIMENTS WITH POTATOES.

THERE ARE ERRORS in opinions and practice which have long prevailed among farmers, and which one copies from others without submitting the questions to actual and measured experiments. In order to point out distinctly some of these errors, the following trials were made, mostly through several successive years:

CUT AND UNCUT POTATOES.—The skin of the potato is nearly impervious to moisture, and so long as it remains entire, the water is retained within, and the tuber is a long time in shriveling. As soon as cut, the moisture escapes rapidly. If, therefore, the ground is dry and cloddy,

and the time of planting late, it is best to plant the potatoes whole. If cut pieces are used as seed, it will be found that many of them dry up and fail to grow, and the crop is broken by vacant spaces. By early planting in rich and mellow ground, the moisture is retained in the cut pieces, and all grow freely; and the advantage derived from cutting, namely, fewer stalks and fewer and larger potatoes, are secured without difficulty.

LARGE AND SMALL POTATOES.—Medium sized and large potatoes always give a heavier crop than quite small ones, when other controlling circumstances are the same. The larger amount of nutriment which the young shoots derive from the tuber, give them an earlier and more vigorous start; yet, under proper management, the difference is much less than is commonly supposed, or that which follows careless cultivation. In one experiment, we tried in alternate rows the planting of tubers which were not more in diameter than a man's finger, in one row, and those double the size of hen's eggs in the next, and so on over a considerable area. Fig. 230 shows the relative sizes on a reduced scale. Special care was taken that whether large or small, each piece had the same number of eyes. Mistaken conclusions are often drawn by cutting the smaller potatoes into fewer pieces, as a common laborer will be sure to do, unless special attention is given to this point. The consequence is, more sprouts spring up from the small potatoes, and the resulting crop is more numerous in tubers, and they are smaller in size. The conclusion that it is the small seed that necessarily produces small potatoes, is obviously an erroneous one. A small inserted graft, or a small tree when set out, does not yield afterwards smaller apples than a large graft or large tree—all depends on the culture given. In the experiment with the small and large potatoes, care was taken to secure a deep, mellow, moist soil, and to plant them so early that there could be no failure from drouth. They came up nearly at the same time, and the appearance of the rows was similar through the season. When the potatoes were dug, the contents of each row were placed in heaps at the end and examined. No perceptible difference was observed in the size of the potatoes; but when they were measured, it was found that the large potatoes yielded 11 per cent. the most—doubtless owing to a stronger growth of the shoots at the outset. In another experiment the smaller potatoes gave the larger crop. The reasons were these: The large seed was cut and planted with so few eyes, that the number of plants in the rows were too few for the best product. The same care as above mentioned was not taken to have the same number of eyes in both cases, and

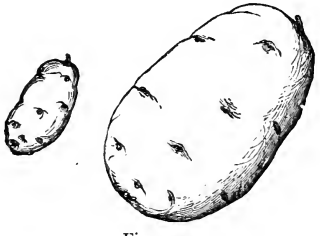

Fig. 230.

the men who cut and planted gave double the number of eyes to the pieces from the small seed. The crop in these rows consisted, therefore of a much larger number. The small tubers were about half the size of hen's eggs; the large ones five or six times as large. The rows from the small seed yielded nine bushels from each of the rows; those from the large seed only eight bushels.

The experiment is given in detail to show the importance of taking the controlling influences into account. One reason why experiments so often give contradictory results is that the amount of the crop is blindly given, without observing all that may have operated on it.

HILLING.—A number of experiments have been carried out for determining the comparative advantages of hilling up the earth about the plants, (which is nearly the universal practice,) and cultivating with a flat surface. The latter has invariably given the largest crops. The percentage of loss varies with the depth of the soil and the abruptness of the hilling. When done thoroughly, the loss is about 16 to 18 per cent.; when the hilling is moderate, it is correspondingly less. The average from common practice, is from 12 to 15 per cent., and millions of bushels are annually lost in this way throughout the country.

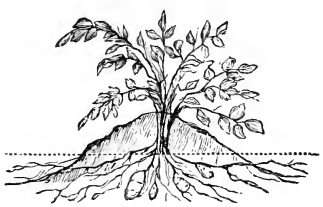

Fig. 231.

The rationale of this result is that when fresh earth is heaped on the roots near the plants, they are buried too deep, while the ends of the roots are denuded or torn, fig. 231, the dotted line being the natural surface. When cultivated flat, all have a free and natural growth.

DEPTH OF PLANTING.—Potatoes should not be planted shallow. A deep soil, and moderately deep planting, afford more security against changes of moisture and dryness. We find that when the planting is about 5 inches deep, about 10 per cent. more potatoes are given than when planted only 2 or 3 inches deep; but the result will vary much with the depth and condition of the soil, and the moisture and drouth of the season.

CHANGE OF SEED.—The experiments under this head have been limited. It is well known that certain varieties succeed much better in some localities than in others, and variously yield more or less, or give better or poorer potatoes. In some places certain sorts "run out" sooner than in others. It may therefore be expected that when a variety has deteriorated in product in one place, an advantage would result for a time from procuring seed potatoes from neighborhoods where it succeeds better. The only distinct experiments we have tried were the following: The Early Rose having diminished from its early abundant yield, seed was procured a few years ago from a neighborhood seventy miles east. The

crop from this seed was about 10 per cent. more than from the old seed planted side by side. A quantity of seed of the Late Rose was brought from sixty miles west, and planted side by side with seed which we had raised from its first introduction. While rows from the old seed gave each 10 bushels from the row, the seed from a distance yielded over 13 bushels from each row; in both instances, with much uniformity in the several rows. It is proper to add that in both cases the places from which the seed was brought are regarded much better in soil for potatoes than the ground on which the experiments were made.

ITEMS IN FLORICULTURE.

FINISHED FLOWER BEDS.—We noticed in a former volume the beds of geraniums, colored-leaved plants and of the sempervivums, on the grounds of Messrs. Ellwanger & Barry, at Rochester. As they

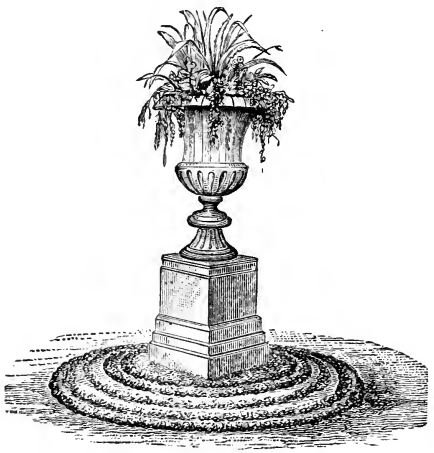

Fig. 232.

have given special attention to this kind of planting, we furnish engravings of a few, with lists of the plants occupying them. It should be understood that such beds are not for picturesque grounds, but only for such as approach the geometric style with high and elaborate finish.

A vase of plants stands in the centre of a smooth bed planted chiefly with the dense rosette-formed plants of the Crassulaceæ (fig. 232.) The outer circle is *Sempervivum globosum ;* the second, *S. californicum ;* the

third, *Echeveria secunda* and *secunda glauca ;* the centre, *Echeveria metallica.* The symmetrical characteristics of this bed, situated in the smoothly shaven grass, with the vase at the centre, present altogether a striking appearance, and such beds strictly belong to the more symmetrical and finished portions of ornamental grounds.

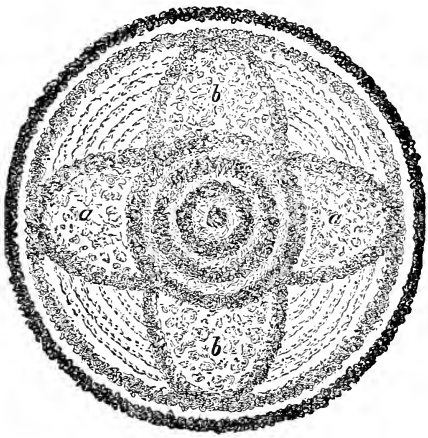

Fig. 233.

Fig. 233 is the plan of a bed of geraniums, about 25 feet in diameter, which, when in full bloom, presents a rich variegated appearance, each sort occupying a broad surface of the bed. The outer circle is formed of a low, profuse-blooming Lobelia and the circle is at all times a distinct blue. The next circle within is the light *Pyrethrum aureum.* The centre of all is the brilliant scarlet geranium known as the Hector; the opposite

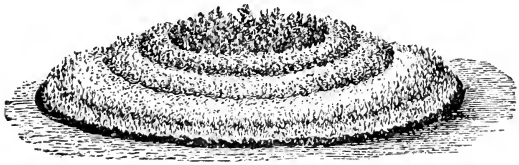

Fig. 234.

wings, *a a,* are planted with the pink Master Christine ; the wings *b b,* with the cherry-colored Marshal Vaillant, and the four triangular spaces between with the silver-leaved geraniums.

Fig. 234 represents imperfectly an oval bed of colored-leaved plants, slightly convex, and set with the following plants : In the centre is Coleus

Hero, which is almost black; next is *C. verschaffeltii*, crimson; the third circle is the Golden Gem; the fourth *Achyranthes caseii;* the fifth, the white leaved *Centaurea candida;* and the outer circle, a variety of *Mesembryanthemum cordifolium.*

LAYERING CARNATIONS IN CUPS.—It is in cups of well-rolled lead, according to the *Fleurs de Pleine Terre*, that the celebrated cultivator of carnations, M. Gouthier of Pierrefitte, has so successfully practiced their propagation by layering. The lead used for these cups is rolled out to the thickness of strong paper, and then cut into triangular bands. These are formed around the finger to a shape somewhat like a small sugar paper (fig. 235.) The soil employed is fine, and the same as that used for culture in pots; threads serve to support the cups in position, and a pin thrust through helps to secure them and keep the layer in position.

Fig. 235.

Common tinfoil would doubtless answer the same purpose, although not quite so pliable as lead.

CUTTING-POTS.—The following mode of propagating by cuttings was furnished by a correspondent to the London Garden, and appears to be a useful contrivance: Those who find their pelargoniums and other cuttings

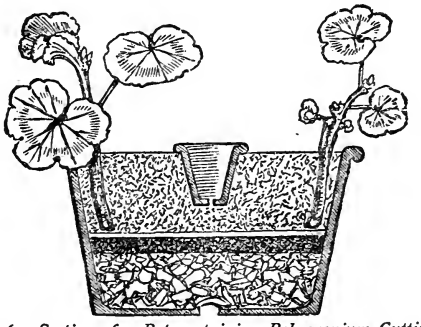

Fig. 236.—*Section of a Pot containing Pelargonium Cuttings.*

to suffer from damp, should try the method indicated in the accompanying illustration (fig. 236.) The damping off of cuttings usually results from applying water by pouring it on the surface of the soil, and allowing it to

percolate through, but if a small pot be sunk in the middle to receive it, moisture will be supplied where it is of most use; the quantity can always be regulated, and the cuttings are not so likely to suffer so much from an occasional overdose as they otherwise would. The best pots for pelargonium cuttings are those whose width exceeds their height. The section, which is taken vertically through the middle of the pot, shows the cuttings, two only of which appear; the mould in which they are planted should contain plenty of silver sand, a thin layer of that material resting on a layer of cocoanut fibre, and below that a quantity of corks or washed cinders to insure perfect drainage.

IMPROVED PROPAGATION BY CUTTINGS.—Peter Henderson describes an improved mode he has been using for the propagation of geraniums. His object was, in the first place, to avoid the exhaustion of the parent plants by the removal of cuttings abruptly; and secondly to make sure work. He takes the young shoot which is to be used as a cutting, and snaps it short, leaving it hanging by a small portion of the bark, as shown in fig. 237. This shred is sufficient to sustain the cutting, without any material injury from wilting, until it forms a callus, which precedes the formation of roots. In from 8 to 12 days it is detached and potted in 2 or 3-inch pots. It is rather less shaded and watered than ordinary cuttings, and forms roots in about 8 to 12 days more. One autumn Mr. H. propagated about 10,000 plants of the tricolor class, without losing one per cent. With the common method, he thinks he would have lost 50 per cent.

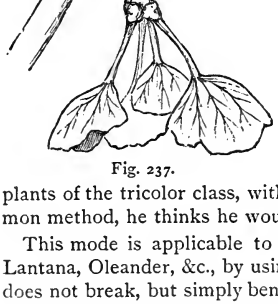

Fig. 237.

This mode is applicable to the Abutilon, Begonia, Carnation, Cactus, Lantana, Oleander, &c., by using young unripened shoots. If the shoot does not break, but simply bends to a knee, a knife may be used for cutting about two-thirds through.

STRIKING CUTTINGS—EASY MODE.—The Rural New-Yorker gives in substance the following method, which has been found remarkably easy:

Take a flower pot about 8 inches in diameter, invert a saucer within it large enough to rest against the sides half way down, or lower, which is better than using broken crocks or stones. This drainage is necessary where there is no bottom heat. Then fill to the brim with very coarse sifted sand. Place the pot in a strong light, and saturate the sand a few hours with water, providing a proper vessel for drainage. Make the cuttings from 2 to 5 inches long, retaining more leaves in autumn than earlier, but stripping them off nearly to the top, and insert them half an inch in depth, about twenty to the pot. New buds in time will show that roots are formed, when they are to be lifted out with a teaspoon, and set in

small pots of rich sandy earth, avoiding clayey soil, which will become too hard. If too many leaves are left on the cutting, they will be likely to droop. September is a good time for this work.

TESTING SEEDS.—One of Mr. Vick's correspondents gives the following as his way of testing seeds: A sod cut from an old pasture is placed grass up in a pan or on a board, and boiling water poured on; on this is is laid a piece of straw paper, and the seed is sprinkled on this and covered with another paper, then another sod, grass down, well wet with warm water. Keep wet and warm, and in a few days the seeds, if good, will sprout.

COCOANUT FLOWER-POTS.—Some of the Centennial exhibitors used, with great success, the shell or husk of the cocoanut, in the manufacture of flower pots. This husk, which is nearly an inch thick, is cut across the middle, so as to make two baskets, and each portion is suspended by wire. Its porous character seems to fit this material to this purpose, and its ornamental appearance, with something of a rustic character, makes it superior to the most ornamental porcelain. Plants are said to thrive admirably in these pots.

PAPER PROTECTORS AGAINST FROST.—When house plants are kept in common rooms, it sometimes happens that an intensely cold night threatens to injure or destroy them. When this danger is feared, place them anywhere together, the centre of a room on the floor being the most convenient, and then put one or two thicknesses of newspapers over them, pinned around them. They will then bear several degrees more of frost than without the papers. A similar protection may be afforded to plants in the open ground to guard against spring frosts, by nearly covering with newspapers, on the corners of which small stones are laid.

WINTER BLOOMING OF GLADIOLUS.—A Boston correspondent of the Gardener's Monthly recommends, in substance, the following mode for obtaining winter flowers trom the Gladiolus: Plant the bulbs about the middle of July in a rich, open border. When a foot high, and in dry weather, pot them. Before frost, remove to a sunny window in the house, and keep them well watered.

HYACINTHS IN WINTER.—James Vick remarks, in his Illustrated Monthly, that it is important to keep hyacinth bulbs cool and dormant before planting in autumn, in order that the new growth may not start and consume and dry up the bulb, on which it must entirely depend before planting. If planted in earth and kept in a cool place, roots will form and furnish nutriment, and the bulb will not then be exhausted and ruined. When planted in water, roots are formed, but the new plant must exhaust the bulb more or less for nutriment, and hence the reason that bulbs in water-glasses are so weakened that they do not do well a second year. Hence the superiority of the method of planting in soil in pots.

HYACINTHS IN MOSS BASKETS.—Hyacinths in water, and in soil in

pots, are common ornaments for winter. Peter Henderson describes the mode for placing them in moss baskets. He recommends the common brown water-moss used by nurserymen and gardeners, but for the outside and the top we would prefer the smooth green flakes taken from rotten logs in the woods. Press the moss moderately firm into the wire basket, the bulbs being one-third above the surface. The whole is then saturated with water, and placed in some dark, cool place, as a cellar or closet, where the temperature is not above 50°. In five or six weeks the roots will fill the moss. The basket is then brought into a room and hung against a window, with a temperature of 60° or 70°, and the plants will bloom in three or four weeks. Watering them with very weak guano water once a week greatly increases their size and brilliance; an ounce of guano to a gallon of water is enough. The bulbs may be prepared successively from November into January.

EARLY FLOWERS.—A young gardener wishes to know what flowers may be employed for the earliest blooming in spring. The following are very early bloomers: Pansy, snowdrop, crocus, Siberian squill, the wild hepatica, the earliest primroses, and the claytonia. The snowdrop, crocus and squill, being bulbs, must be set out the previous autumn; the others when in a dormant state.

The London Garden describes a good method of mixing spring flowers with bedding plants to produce a beautiful effect. Small beds of Siberian squill have borders 8 or 10 inches wide of *Narcissus minor;* and such bulbs as die down in summer, like squills, anemones, jonquils, &c., may be dug up every third year and the soil enriched. Summer bedding plants may be placed between and occupy their places. A bed of anemones has a bed of verbenas growing through it. If heavily top-dressed in autumn, they do well.

ROSES IN WINDOWS.—The Agriculturist gives the following as the essential requisites for growing roses in rooms, which we condense; Selecting the best fitted sorts of plants raised and kept in pots, and not from open ground, keep in a room not too dry, at a temperature of about 70° in the day time, and 50° or more at night, using liquid manure if the soil is poor, avoiding over-watering or soaking with standing water, showering once or twice a week, and turning the ball of earth out sometimes to see if there are angle worms, or watering with lime-water to repel them. Remove plant lice with tobacco water. Cut back a shoot that has blossomed, to a good bud. Avoid cold drafts, which cause mildew. Fork up the soil and keep it mellow.

THE BEST ROSES.—A gentleman of intelligence and very familiar with the great collection of roses in the nursery of Ellwanger & Barry of Rochester, sends us the following lists of the best hybrid perpetuals: For the best six—Alfred Colomb, large, full, brilliant crimson, fragrant: Madame Victor Verdier, large, crimson, moderately full; John Hopper, bright rose; La France, silvery rose, globular, highly fragrant, constant

bloomer, slightly tender; Countess Cecile de Chabrillant, deep pink, full, perfect in form; Charles Lefebvre, reddish crimson. For the best twelve, add to the preceding list the following six: Louis Van Houtte, Senateur Vaisse, Ferdinand de Lesseps, Marie Baumann, Prince Camille de Rohan and Marquise de Castellane. Next after these, for a larger collection, are named General Washington, Caroline de Sansal, Anne de Diesbach, Victor Verdier, Maurice Bernardin, Duke of Edinburgh, &c.

The following hardy varieties are given by W. H. White of Massachusetts, in a paper read before the Massachusetts Horticultural Society, and recommended as adapted to New-England: *Hybrid Perpetuals*—Alfred Colomb, Charles Lefebvre, Countess Cecile de Chabrillant, John Hopper, La France, and Madame Victor Verdier. *Miscellaneous*—Queen of Prairies, Blanche Fleur, Madam Hardy, Persian Yellow.

THRIFT FOR WINDOW POTS.—This well-known plant (*Statice armeria*), which was once extensively used as an edging to garden beds, is pronounced by James Vick one of the best flowering plants for pots in windows, withstanding, as it does, very hard usage. He chopped a mass of it out of the frozen ground one winter with an axe, and potted it in his office, where, under good care, it made a fine round mass after some weeks, and bloomed freely. It was subsequently much neglected, but a good watering at any time immediately restored it.

VIRGINIA CREEPER.—The London Garden speaks in strong terms of admiration of this climber (*Ampelopsis*), and states that on the Continent, it is largely employed to decorate structures, and is seen falling "in immense sheets over walls, banks and bridges." In a private garden, an iron-covered trellis is completely sheeted with the Virginia creeper, displaying "immense walls of rich and glowing colors."

ORCHIDS.—The London Garden mentions the following species of American orchids as being well worthy of cultivation. Some are quite common in our woods and bogs, and others are more rare: *Cypripedium spectabile*, *C. acaule*, the common *C. pubescens*, and the rare *C. candidum*. Also the well-known *Calopogon pulchellus* and *Pogonia ophioglossoides;* the rare *Arethusa bulbosa*, *Orchis fimbriata*, and the variegated-leafed *Goodyera pubescens*. The rare and beautiful *Calypso borealis* is also mentioned. All these beautiful or curious species are worthy of more attention than they receive in this country, while English horticulturists prize them highly and give them special care.

ORNAMENTAL SHRUBS.—The Iowa Horticultural Society gives the following list of shrubs, which bear red berries, and which present an ornamental display late in the autumn or into winter: High-bush cranberry, strawberry tree (*Euonymus*), mountain ash, buffalo berry and bittersweet (*Celastrus*). To these we add the barberry, which gives a profusion of scarlet berries nearly all winter; and the *Prinos* (black alder), which is nearly unequalled in its crimson masses till spring; and although growing in mucky swamps, succeeds quite as well when removed to upland.

THE METRIC WEIGHTS AND MEASURES.

By D. A. A. Nichols, Albany, N. Y.

THE USE OF STEAM AND ELECTRICITY has made all the civilized nations of the earth in a great measure cosmopolitan, producing unity of thought, aims and purposes. The producer in every land sells his products in all the great markets of the world, and is brought into more or less direct contact with far off as well as neighboring consumers. The commerce of the present day requires familiarity with the products of all nations, and their relative values. In order to buy or sell intelligently and profitably, producers and merchants must readily and quickly comprehend the comparative weights, measures and money of all nations with whom they do business, or are likely to. Formerly each nation had a system (or rather set, as no system was observed) of weights and measures, in the use of which they had been educated, knowing or caring for no other. This was true, even of nations claiming to be enlightened, whose merchants penetrated into all parts of the earth. England, for example, until within a short time, had a bushel the contents of which varied greatly in different counties in the kingdom. The measure called a gallon was of four different sizes, according to whether a wine, beer, dry or imperial gallon was used. These respectively contain 231, 282, 268.8 and 277.274 cubic inches. A pound contains 5760 or 7000 grains, according as troy or avoirdupois weight is meant.

Nearly as much confusion prevails in the United States. According to the United States laws, the "Winchester" bushel is the standard of dry measures, and this contains very nearly 2150.4 cubic inches. In the State of New-York the legal bushel is the English "imperial" bushel, containing 2218.192 cubic inches. A seedsman buys timothy seed in Illinois at 45 pounds to the bushel, and sells it in the Eastern States at 44 pounds to the bushel, and both are legally correct weights. The bushel of barley varies in the different States from 45 to 50 pounds, and that of oats from 30 to 36 pounds. It is evident, therefore, that there is no system or standard in common use in these countries.

Between the years 1790 and 1795 a committee of members of the French Academy of Sciences, in obedience to a request of the government, devised the system of weights and measures known as the "metric system," in order to make commercial transactions more intelligible to the people in all parts of the empire. The points aimed at were to have a single standard for all weights and measures, (such standard to be readily ascertained at any time) and to have as few terms as possible. The committee selected the ten-millionth part of the distance from the equator to the pole as the standard, and called it the *metre*, (from the Greek *metron*—a

measure,) being equal, very nearly, to 39.3707904 inches of the English standard.

The system was legalized in France in 1795, and since 1840 there have been penalties attached to the use of any other. It was legalized in England in 1864, and in the United States in 1866, but has not been made compulsory in either country. It is commonly used all over the Continent of Europe, and is in universal use by scientific men in most of their calculations. It is easily learned, as only about twelve different terms are needed; and calculations under this system are simple, as it is a decimal one. The only trouble with the system is in ascertaining the exact length of the metre, but the astronomers of the present day have established the length of a great meridian very closely, so that there is no great trouble in fixing the length of the metre.

In forming tables of weights and measures in this system, the unit of each kind is increased by using Greek prefixes, indicating the increase of value. Ten metres are called a dekametre, one hundred metres make one hectometre, a thousand metres are called a kilometre, and ten thousand metres make a myriametre. One-tenth of a metre is called a decimetre, one-hundredth of a metre is a centimetre, and one-thousandth of a metre is a millimetre. These prefixes are derived from the Latin. The unit of weight, called a gramme, and that of capacity, called a litre, are increased and decreased in the same manner, and by the use of the same prefixes.

After these are once learned, there is no more trouble in reckoning commercial transactions in which the metric system is used than in the simplest problems in addition, subtraction, multiplication or division, as only the Arabic or decimal notation is used. The measures of surface have for the unit the *are*, and for those of solids the unit is the *stere*. The *are* increases and decreases, of course, by hundreds and hundredths, (the square of ten and one-tenth,) so that we have no dekare, but only the hectare (or 100 ares) above the unit, and only the centiare below it. Except in land measurements, the are is not used, the square metre being the ordinary unit of surface. The stere is only used in measuring wood and solid timber, the cubic metre being the unit otherwise, or rather the cubic centimetre in all except large measurements.

The standard *metre*, by which all others are determined, is a rod of platinum, kept in the national archives at Paris, which rod is only exact at the temperature of 0° centigrade (32° Fahrenheit), the point at which ice melts. The United States and England have each an exact copy in the same metal. Scientists use rules of two decimetres (one-fifth of a metre) in length, graduated to millimetres, and for very fine work these graduations are subdivided. Carpenters, masons and mechanics use rules similar in form to those graduated into feet and inches, graduated as finely as the nature of their work requires.

In measuring dry goods, a wooden metre is used, graduated to decimetres only. Surveyors and engineers use tapelines and chains ten

metres long, and graduated as finely as needed. The kilometre is the unit of distance, and stones or posts along the highways are put at that distance apart. The unit of capacity is the *litre*, which is equivalent to a cubic decimetre (one-thousandth of a cubic metre), and the hectolitre is the ordinary measure used in buying and selling grain, roots and other farm products, including wine and oil. The unit of weight is the *gramme*, which is the weight of one cubic centimetre of distilled water at the level of the sea, and at its maximum density —4° centigrade; 39.83° Fah.—weighed in a vacuum. The kilogramme—1000 grammes—is the ordinary unit of weight in commercial calculations. It will be seen that when once the length of the metre is obtained, all the weights and measures in this system may be readily determined by it. The system is therefore called the metric system.

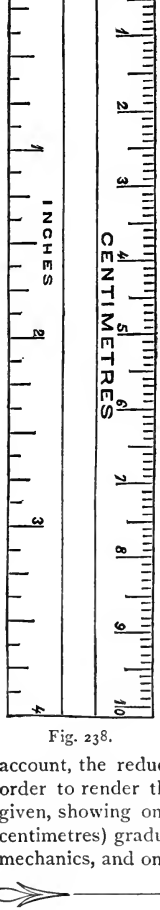

Fig. 238.

The reduction of the metric to English measures is comparatively easy. A metre is 39.3707904 inches; a dekametre is ten times as much; a hectometre one hundred times; a kilometre one thousand times, and a myriametre ten thousand times as much. A decimetre is one-tenth of a metre, equal to nearly 4 inches; a centimetre is one hundredth, or four-tenths of an inch, and a millimetre is one-thousandth of a metre. The are, in land measure, is ten metres square—100 square metres; 119.411 square yards, or 0.0247114 of an acre—and a hectare is therefore 2.47114 acres. A cubic metre is 35.31481 cubic feet. The kilogramme (1000 grammes) is 2.20462125 pounds avoirdupois. The common nickel 5-cent coin weighs just 5 grammes, and measures 20 millimetres in diameter.

The changing of the litre into English measures of capacity causes the most trouble, as we are compelled to calculate for gallons of several sizes. The litre contains 61.027053 cubic inches, and the gallon dry measure has 268.8 cubic inches. Wine measure has a gallon of 231 inches, and the imperial gallon has 277.274 cubic inches. These being taken into account, the reduction of the French to English measures is easy. In order to render the comparison of the two measures plainer, fig. 238 is given, showing on one side one-tenth of a metre (one decimetre, or ten centimetres) graduated to millimetres, like the rules in ordinary use by mechanics, and on the other edge is the English standard of four inches

long, also divided as usual. Five nickel five-cent pieces laid edge to edge along a straight line will cover the same length as the metric rule in the figure. Boxwood rules twice the length, and graduated like the cut, can be obtained in all the large cities in this country at about 25 cents each. Ivory rules cost six or eight times as much.

The following are the complete tables of the metric system, with their equivalents in English measures:

MEASURES OF LENGTH.

				English Equivalents.
10 Millimetres	=	1 Centimetre	=	0.3937 inches.
10 Centimetres	=	1 Decimetre	=	3.937 inches.
10 Decimetres	=	1 METRE	=	39.3707 inches.
10 METRES	=	1 Dekametre	=	32 feet, 9.708 inches.
10 Dekametres	=	1 Hectometre	=	19.8842 rods, or 109.363 yards.
10 Hectometres	=	1 Kilometre	=	0.62137 mile.
10 Kilometres	=	1 Myriametre	=	6.2137 miles.

MEASURES OF CAPACITY.

				Dry Measure.	*Wine Measure.*
10 Millilitres	=	1 Centilitre	=	0.6102 cub. in.	0.338 ounce.
10 Centilitres	=	1 Decilitre	=	6.102 cub. in.	0.845 gill.
10 Decilitres	=	1 LITRE	=	0.908 quart.	1.0567 qts.
10 Litres,	=	1 Dekalitre	=	9.08 quarts.	2.6417 gal.
10 Dekalitres	=	1 Hectolitre	=	2.8375 bush.	26.417 gal.
10 Hectolitres	=	1 Kilolitre	=	1.308 cub.yds.	

MEASURES OF WEIGHT.

				Avoirdupois.
10 Milligrammes	=	1 Centigramme	=	0.1543 grain.
10 Centigrammes	=	1 Decigramme	=	1.5432 grains.
10 Decigrammes	=	1 GRAMME	=	15.4323 grains.
10 Grammes	=	1 Dekagramme	=	0.3527 ounce.
10 Dekagrammes	=	1 Hectogramme	=	3.5274 ounces.
10 Hectogrammes	=	1 Kilogramme	=	2.2046 pounds.
10 Kilogrammes	=	1 Myriagramme	=	22.0462 pounds.
10 Myriagrammes	=	1 Quintal	=	220.4621 pounds.
10 Quintals	=	1 Tonneau	=	2204.6212 pounds.

MEASURES OF SURFACE.

1 Centiare	=	1 square metre.	=	1550 square inches.
1 ARE	=	100 square metres.	=	119.6 square yards.
1 Hectare	=	10,000 square metres.	=	2,471 acres.

MEASURES OF SOLIDS.

1 Decistere	=	100 cubic decimetre.	=	3.53144 cubic feet.
1 STERE	=	1 cubic metre.	=	0.27590 cord of wood.
1 Dekastere	=	10 cubic metres.	=	13.07900 cubic yards.

The *are* and its compounds are only used in measuring land, as we use acres and rods. The *stere* and its compounds are used in measuring wood and lumber only.

The following table will be found useful for reference, the first part giving the metric equivalents of English measures and weights, and the second part giving the English equivalents of the metric weights and measures:

1 yard	=	0.91438347 of a metre.
1 foot	=	0.30479449 " "
1 inch	=	0.02539954 " "
1 mile	=	1.6093149072 " kilometre.
1 square foot	=	0.09304 " square metre.
1 acre	=	40.46711 ares.
1 acre	=	0.4046711 of a hectare.
1 square mile	=	2.59405 square kilometres.
1 cubic foot	=	28.318019 cubic decimetres.
1 cubic foot	=	0.028318019 cubic metre.
1 grain	=	0.06479895 of a gramme.
1 pound, avoirdupois,	=	0.4535926525 of a kilogramme.
1 gallon, imperial,	=	4.54368 litres.
1 bushel, Winchester,	=	0.35243 hectolitre.
1 metre	=	39.3707904 inches.
1 metre	=	1.09363307 yards.
1 kilometre	=	0.621383 mile.
1 kilometre	=	198.84256 rods.
1 square metre	=	10.74702 square feet.
1 square kilometre	=	0.385496 square mile.
1 are	=	39.53824 square rods.
1 hectare	=	2.47114 acres.
1 gramme	=	15.43234874 grains.
1 kilogramme	=	2.20462125 pounds avoirdupois.
1 litre	=	0.220096 gallon, imperial.
1 litre	=	0.2641863 gallon, wine measure.
1 litre	=	61.027053 cubic inches.
1 hectolitre	=	2.8374033 bushels.
1 hectolitre	=	0.82494 barrels, wine measure.
1 hectolitre	=	22.0096 gallons, imperial.
1 hectolitre	=	26.41863 gallons, wine measure.

In using these tables for ordinary calculations, one or two decimals will suffice to give the approximate result. When more exactness is required, all the decimals will of course be needed. For instance, an item of agricultural news from France may be published stating that a farmer, by good cultivation, obtained a yield of 40 hectolitres of wheat per hectare. By referring to the table, we find that a hectolitre is 2.8 bushels, (and a little more), and that a hectare is nearly 2½ acres. It is easy therefore to find from this that the crop was about 45 bushels per acre. One hectolitre of seed sowed on a hectare of ground is a little over a bushel and four quarts of seed per acre. Five kilogrammes of sugar is a little over eleven pounds. A firkin of 100 pounds of butter contains 45⅓ kilogrammes. A bushel of wheat is a little over 27 kilogrammes in weight. A little practice soon fixes in the mind the comparative values of these weights and measures.

A MODEL DAIRY BARN.

By W. I. Chamberlain, Summit County, Ohio.

IT SEEMS LIKE PRESUMPTION to claim to present a model dairy barn after the many excellent plans that have appeared in the Country Gentleman from time to time, and in the pages of the Annual Register of Rural Affairs for twenty-five years past I simply hope to offer plans that shall meet the wants of good dairy and mixed farmers on

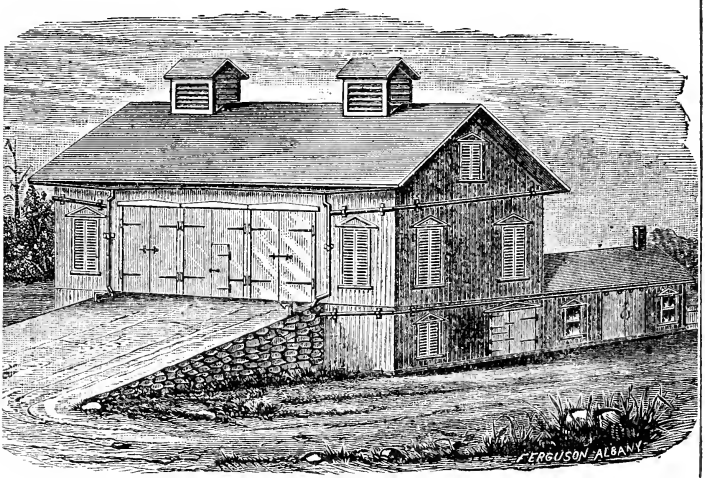

Fig. 239.—*Mr. Chamberlain's Model Dairy Barn.*

the Western Reserve, better than any I have yet seen. The barn combines the best features of many excellent ones that I have seen in different parts of the country, with several features that I have never seen in any except my own, and that have proved exceedingly valuable on thorough trial. The plan herewith presented is not, however, exactly that of my own barn. That was built of four old ones which cursed the farm when I bought it, and which I now wish I had given away or burned. Under the high prices then they saved me some $300 in timber and lumber, but gave me a barn that will never be fully satisfactory. The plan herewith presented, is as I should build now, from new material, and essentially as I did build, trammeled as I was. The points I claim are:

1. Economy of space; no waste room.
2. Economy of manure; no waste of liquids.
3. Economy of money; no useless expense.
4. Economy of feed, by keeping stock and drinking water warm.

5. Economy of labor in storing and feeding, by always taking advantage of the force of gravitation.

6. Economy of labor also, by putting everything under one roof; stock,

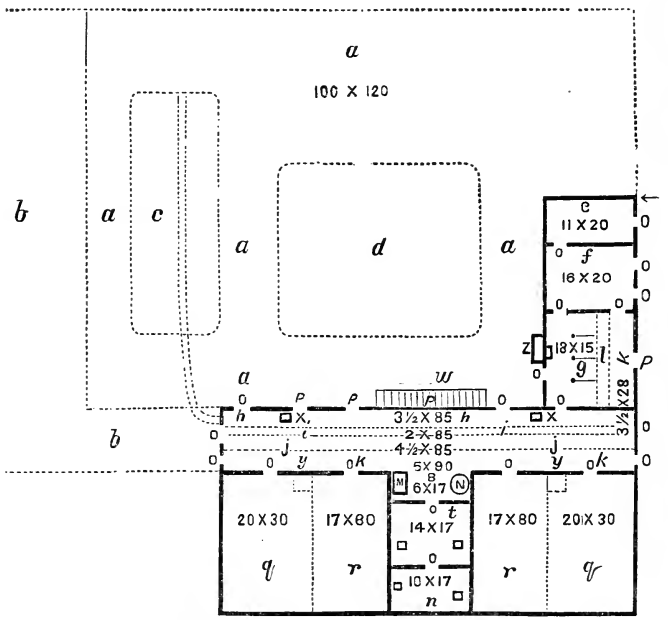

Fig. 240.—*Plan of Basement, Wing and Barnyard*—a a a, *Barnyard, surrounded by high tight fence*; b b, *Lane to Pasture, &c.*; c, *Manure Pile, with elevated track for manure truck*; d, *Straw Stack if needed*; e, *Shop and Tool Room, with chimney and coal stove*; f, *Carriage Room*; g, *Stable for four horses*; h h, *Walk behind the cows*; i i, *Water-tight Manure Gutter behind cows*; j j, *Row of Cows, stanchioned*; k k k, *Feed Passage and Walk*; l, *Horse Mangers for hay and grain or cut Feed*; M, *Water-tight Box on four wheels, for carrying water or cut feed*; N, *Tank supplied from cistern in bank by underground iron pipes and regulator*; o o o, *Doors*; p p p, *Windows*, q q, *Hay Bays from roof to basement*; r r, *same with movable barn floor for each*; s, *Space for water tank and mixing trench*; t, *Meal Room or Granary, with trap-doors from barn-floor*; w, *Covered Stairway for horses, from barn floor to horse or cow stables*; x x, *Landing from straw shoots above*; y y, *Landing from hay shoots above*; z, *Water Tank, fed from cistern, for horses, and for cattle in yard in summer*; n, *Root Cellar or Meal Room.*

feed, absorbents, water, implements, repair shop—all conveniently accessible to each other.

I can best describe the barn and what I deem its excellencies, and the best mode of using it, by following these points, constantly referring to the engravings, figs 239, 240, 241 and 242.

1. Economy of Space.—The main barn is 45 by 90 feet, with posts

18 feet, besides 9 feet basement, and contains stabling for 30 cows, and storage for 135 tons of hay, 12 tons of straw (allowing double the bulk of hay), and 12 tons of bran or 24 tons of meal, and leaves the middle barn floor, 17 by 45 feet, and 10 feet high, for horse power and feed and straw cutter, if desired, and for storage of wagons, machines, &c. The wing or L is 20 by 45 feet, one story high, and gives room for 4 horses, 5 or 6 wagons and buggies, implements, &c., and a good repair shop and tool room, The *storage* is as follows: Hay occupies the north two-thirds of the main barn (see fig. 241, *a a*, and fig. 240), from ground to roof, and the whole length except the middle (permanent) barn floor, beneath which are meal rooms, &c., (see fig. 240, *m*, *n*, *t*, *u*,) and above the south two-thirds of which is a scaffold resting on the second girt, (fig. 241, *h h*.) This scaffold is laid after the threshing is done, and from the timber, &c., before used as temporary barn floor. It is used to store "rowen" hay. The cow stable occupies one-third of the basement, the whole length of the south side, (fig. 241, *b*, and fig. 240, *h*, *i*, *j*, *k*.) Above this (fig. 242, *a*, *b*, *c*, *d*, *e*), straw is stored *to the roof*, as hereafter described, directly from the machine, with ready access by shoots (fig. 241, *o o*, and fig. 240, *x x*, and *y y*), either to feed passage or to manure space. Thus oat straw and bright wheat straw mixed with young timothy, can be used as feed first, and the refuse for bedding; while straw that is useless, except for bedding, need never go to the manger at all. When stock, feed, bedding, machines, implements, &c., are all housed, no waste room is found from basement to roof. This seems to justify the first claim—economy of space.

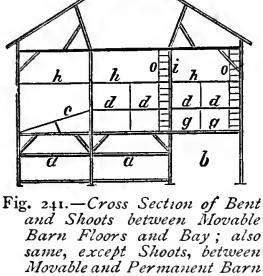

Fig. 241.—*Cross Section of Bent and Shoots between Movable Barn Floors and Bay; also same, except Shoots, between Movable and Permanent Barn Floor*—a a, *Deep Hay Bays, from ground to roof, entire length of barn (except middle barn floor) and two-thirds of the width of barn*; b, *Stable for Thirty Cows, whole length of Barn, and one-third the width*; c, *Joist or Girt for inclined movable barn floor*; d d, *Joist or Girt for elevated movable barn floor*; g g, *Permanent Floor over cow stable*; h h, *Second Girt, for scaffold after threshing time*; o o, *Shoots for hay and straw.*

2. ECONOMY OF MANURE.—The straw for bedding and absorbent is always at hand, and *always dry.* It may be chaffed in the cutting box, if desired, and passed down through the south trap door, (fig. 242, *o*.) It makes better absorbent when chaffed, and handles better in the manure. This all favors the second point—economy of manure. Where there is no straw, the urine is not saved, and where straw is in the stack, often wet, snowy or frozen, it is not half so likely to be profitably worked into manure, saving all the urine. Sawdust may be used with or instead of straw.

3. ECONOMY OF MONEY.—Much of the usual expensive stone masonry is dispensed with Often the entire basement—all four sides—is made of quarried, and even hewn, stone. Here timber and lumber are used, except 51 feet of wall beneath the barn floor doors. Again, *all heavy timber is dispensed with.* The hay rests on *solid ground*, *i. e.*, on a light floor resting on the solid ground. The hay supports the barn, not the barn the hay. When it is full from ground to roof the barn can neither

settle, sag, nor blow away. The typical Dutch barn of Central Ohio and parts of Pennsylvania stores a hundred tons or more of hay and grain on the main floor above the basement. This floor rests on huge, long sleepers 8 by 10 inches in size, 2 or 3 feet apart, and running from front to rear, and projecting 10 or 15 feet beyond the rear basement wall for an "overshot." This "overshot" occupies (or wastes) the entire room of the cow stable in fig, 239, and has always seemed to me a sheer waste. That form of construction, too, requires heavy stone-work in the basement, and for a barn the size of fig. 239 requires some thirty huge sleepers (besides the cross-sills and posts) 45 feet long, 8 by 10 inches in size, and requiring nearly 9,000 feet board measure, of timber, —most expensive, from its great length. Also 8,000 feet of plank flooring to cover it. The barn (fig. 239) saves all this huge timber and most of the flooring by letting the hay *extend to the ground.* It also saves the entire space of the cow stable, by simply enclosing it on the south. It requires no heavy timber anywhere. The basement has no sills (except those overhead), only posts and girts and braces. The posts rest on a single course of quarried stone, or on a single stone for each post, and these on cobbles laid below the frost. Below these a good 3-inch tile drain is laid beneath the entire foundation of the barn, and having a good outlet. This keeps the basement dry, and protects the hay from becoming musty. The bottom girt (fig. 241), is 4 inches above the stone, and will not rot as a sill might resting on sandstone so near the ground. The sills are *above* the basement, 9 feet "in the clear" above ground, and are the only heavy timber required in the barn, except the basement posts. These are 8 by 8 inches. For the other posts, and the plates, 6 by 6 inches, or 6 by 8 inches, is sufficient in a barn that *sustains no weight* except 12 tons of straw above the cow stable, and a few tons of "aftermath" above the middle barn floor. Above the cow stable, no heavy timber is required, as the row of stanchion posts supports the scantling near the middle. Two by six-inch scantling is sufficient. The barn, then, saves money by dispensing with heavy timber and flooring, and heavy masonry.

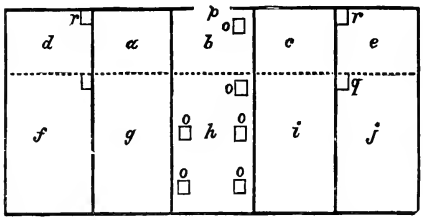

Fig. 242.—*Main Part of Barn above Basement*—a b c d *and* e, *Permanent Floor above cow stable, filled to roof with straw at threshing time;* f j, *Deep Bays, permanent;* g i, *Deep Bays after temporary elevated floor is removed;* h, *Permanent Barn Floor;* o o o o, *Trap Doors to granary and meal room, and cut feed mixing box and manure gutter or root cellar;* p, *Door to straw stack and to stairway for horses* (*see fig.* 240); q q, *Hay Shoots;* r r, *Straw Shoots.*

4. It also secures economy of feed by keeping the stock and their drinking water *warm.* The stable is on the *south side;* is protected above and on the north by 150 tons of hay and straw, by the earth bank, and on the south, east and west, if necessary, by double siding and by double doors and windows. The water in the tanks (*N* and *z*, fig. 240, the tanks having lids), will not freeze in a barn so built, nor will the manure in the gutter or drop. The cattle never shiver, and do not devour hay like those

in a cold barn, or around a colder stack, and drinking freezing water through a hole in the ice.

5. ECONOMY OF TIME AND LABOR.—First in storing the feed. Suppose tne barn empty at the beginning of haying. We open the *west upper* double doors. Here we find a movable or *temporary elevated* barn floor. It is in three sections of 15 by 17 feet; the planks 17 feet long 1 foot wide, running crosswise, the joists, 2 by 6 inches and 15 feet long, running lengthwise of the barn floor. Two movable cross sills sustain the middle bent of joists and the *middle ends* of the end bents. The north ends of the north bent rest in the gains cut in the south side of the north sill. The south ends of the south bent rest on a heavy cross girt. The floor, when in position, elevated, slopes up the girt *c*, fig. 241, and runs along the girts, *d d*, 5 feet above the sills and 15 feet above the ground. Up this slope and along this elevated floor we drive our load of hay, the hay rack being even with the second girt, and the top of the load reaching above the big beam, or 27 feet above the bottom of the west bay (*q*, fig. 240) where the hay is to land. No horse fork is needed, and scarcely a man to mow the hay for the first few loads. A lively hand will throw off the load by hand quicker than two men can unhitch the team and do it with a horse-fork. Before an oncoming thunder storm I one day left the men cocking hay in the field, drove a large load 30 rods to the barn, pitched it into the deep bay, mowed it pretty well in throwing it off, and was back to the field in *eleven minutes*. This is not the ordinary rate, indeed, but time after time—yes, all the time—these huge, deep bays, prove themselves the greatest possible saving of time and labor in storing the hay. The force of gravitation works with and not against you. A team can draw a ton of hay 15 feet up a slop far easier than a man can pitch it 15 feet straight up on a fork, and far easier than a team can haul it up with pulleys and a horse-fork. And the barn will store a hundred tons of hay *below the top of a load* standing on the elevated floor. The hay, too, descends so far that a slight impulse will send a forkful to the back side of the bay.

When the west bay is filled to the roof the floor is moved to the space to which the east doors lead, and the east bay (*q*, fig. 240) is filled to the roof. Then the elevated floor is removed and placed *above the permanent middle floor*, and the bays (*r r*, fig. 240,) are filled with hay from the ground up to the level of the permanent floor, then with grain ready for threshing, to the roof if necessary.

At threshing time the movable barn floor is put to a new use. It is in three sections exactly equal, 15 by 17 feet. Each joist is like all the rest, and all the planks are alike, and timbers and planks are so fitted that they can be placed in *any three* of the *nine equal spaces* (15 by 17) that make up the three barn floors. They are now placed on the spaces *a*, *b* and *c*, fig. 242, 10 feet above the floor over the cow stable, resting on the second girt, *h*, fig. 241. They serve as a high scaffold to catch the straw from the machine, and make it easy to store it clear to the roof in spaces *d* and *e*, (fig. 242,) or if desired, in the bay *g* or *i*, (fig. 242,) as soon as the grain is threshed. When these spaces are filled the temporary floor is removed from *c* and *a*, and these spaces filled from the scaffold still remaining on space *b*. The grain is poured through the trap-doors *o o*, (fig. 242,) into the granaries below.

After threshing, the movable floor may be used again as an elevated one over the permanent floor *h*, (fig. 242,) till the bays, *g* and *i*, are filled to the roof with "rowen," or Hungarian hay, or stalks, or fodder corn.

Finally it may be lifted to the second girt (*h h*, fig. 241) and filled with "rowen" hay, and remain there all winter, leaving the barn floor clear for storage of machines and wagons, and the working of the cutting box. Grain for sale is loaded on wagons standing in the cow stable. Shorts and meal are dumped into the meal-rooms through the trap-doors, *o o*, in the permanent floor (fig. 242). A car load or more can be stored in summer while shorts are low.

The barn saves labor, too, in the care of the stock. Hay and straw are right above, and come down by their own weight when started. Meal and shorts are in front of the cows, next to an unfailing supply of water in the tank *N*, (fig. 240.) This tank, as well as the horse stable tank, *z*, (fig. 240,) is fed from the bank cistern, and is kept always full by a simple and cheap device. Shorts, meal or cut feed may be mixed in the box or movable tank, *M*, (fig. 240,) rolled along the passage, *k k*, (fig. 240,) and shoveled into cows' feed boxes or horses' mangers. Water may be drawn along in this movable tank, *M*, in front of the cows, so that three at a time can drink from it.

In some barns I have seen at the East each cow has an iron sink to drink from, all the sinks being joined by an iron pipe, and fed from a faucet. This makes the watering easier, but the expense, and the surplus water left in the sinks, are two out of several objections against introducing them into an ordinary dairy barn. Indeed, in my barn, the cows are watered in their feed tubs, the water being dropped from the tank, *N*, (fig. 240,) with a six-gallon pail. Thirty cows can be watered thus in far less than in as many minutes. In mild weather they go to the field for water.

The horse stable is adjacent, *g*, (fig. 240,) nnd the horse manure is mixed in the gutter behind the cows. It absorbs urine, helps the cow manure heat a little, and keeps the horse manure from burning in the heap. Instead of taking the manure to the pile *c* (fig. 240) with hand truck or wheelbarrow, a team with sled or wagon may be driven the whole length of the stable when the cows are out, and the manure drawn directly to the field in winter, and put in compact piles of 500 pounds each or so, to be spread and plowed under in spring. I have practiced this method myself with great satisfaction. It saves once loading and unloading the manure, helps forward the spring work, and the unrotted straw and manure have excellent mechanical effect on a stiff clay soil, when plowed under.

6. Labor is saved, too, by putting all animals, feed, bedding, implements, tools and repair shop *beneath a single roof*. No one knows how great a help this is, unless he has tried both ways. Every day, now, I wonder how I ever formerly *lived in four barns!*

The points I deem most original and most valuable are:

1. The very deep bays running to the ground.

2. The temporary barn floor giving ready access to the end bays, and itself leaving a deep bay when it is removed.

3. The *elevated* floors, making so much more down hill pitching.
4. The great amount of storage secured in proportion to the roof.
5. The bank cistern and self-feeding water tank.
6. The position of meal rooms, securing ease of storage.
7. The mode of constructing water-tight stable floor and gutter.

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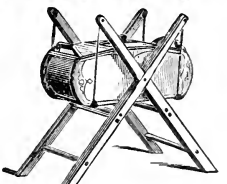
REQUIRES NO MILK ROOM, because being complete in itself it works equally as well in wood-house, barn, or other out-building, as in any other place. It requires capacity for one milking only, because by this system all the cream is extracted from the milk between the milkings. It is not affected by changes of weather, Dog Days and June being alike favorable, because the water in which the milk is submerged, gives the required uniformity of temperature—in fact makes the weather. Impure air, dust or flies cannot reach milk set in it, because it is under water. It makes more butter; because this system raises all the cream, and the quantity is never lessened by unfavorable weather. IT MAKES BETTER BUTTER, because no contaminating influence can possibly get to it; besides, the system improves the flavor. It makes butter of more uniform color, because of the evenness of the temperature in which the cream is raised. IT MAKES BUTTER OF EXCELLENT KEEPING QUALITY. It requires LESS LABOR, because no skimming is done; and when the milk is run out and the cream emptied, it is all perfectly sweet. It is CHEAPER, because the first outlay required is less than the cost of other apparatus, and needing no milk room, pipes or other fixtures, makes it much the cheapest. It requires no large amount of milk to use it, because a small quantity in a single can is as favorably situated for the best results in any size creamer, as though all the cans were filled. Small dairies share equally with large ones in its benefits. It needs no fire, spring or fall. It gives sweet skimmed milk. It is more durable. *No other method of setting milk can truthfully claim these advantages, all of which are either obvious or have been proven by the experience of thousands during the past three years.*

The Butter made by this *submerged* process is taking the lead everywhere. It was awarded the Sweepstakes at the great *International Fair* at New-York in December, 1878, and at the *Royal Agricultural Exhibition* held in London, Eng., in June and July, 1879.

DAVIS SWING CHURN.



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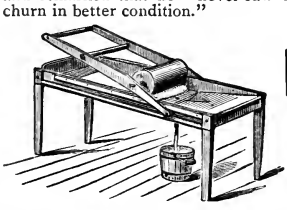
The box contains no floats or inside gear, which mash the butter globules, no corners in which the cream can lodge, to be washed into the buttermilk, and lost when the butter separates. The butter gathers in beautiful granules, in the best possible condition for washing in the churn with cold water, or preferably with cold brine. Hon. X. A. Willard saw the churn tested at the late Dairy Fair, and remarked that he "never saw butter come out of a churn in better condition."



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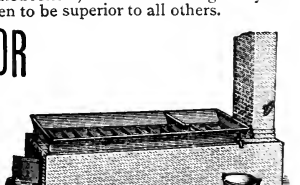

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No longer use Annatto, Carrots, or the poor preparations offered in imitation of our Perfected Color; they will injure your butter. Our Color is far superior to them, and will improve the butter. Especially beware of those prepared in oil or grease, whether in liquid or powder, for they will become rancid, and then surely ruin the butter into which they are put.

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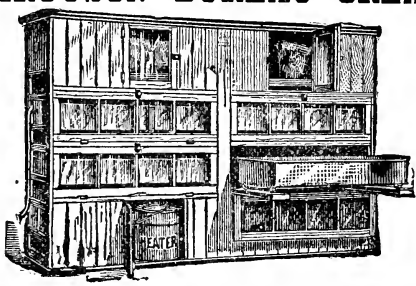

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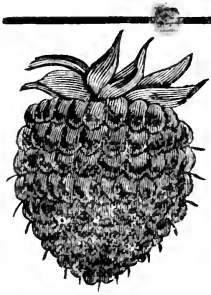

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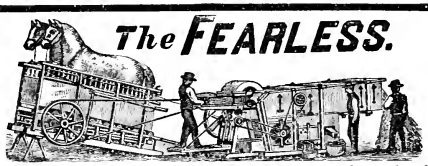

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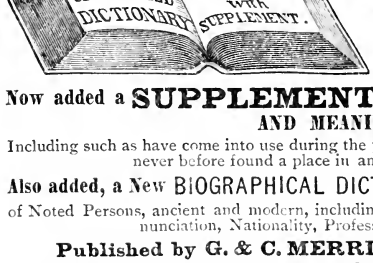

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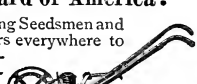

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I annex the names of a few gentlemen who have seen and tested the quality of the Stump Apple:

At the Horticultural Meeting held in Rochester, January, 1876, President BARRY said: "There is an apple known as the Stump apple that is attracting much attention—an oblong, brilliantly colored fruit, like the Chenango Strawberry, very attractive, and sells high in market; has been sold as high as $8 per barrel the past season. Fruit of medium size, yellowish, shaded with red nearly over the whole surface. The tree is a very large bearer."

J. J. THOMAS, Horticultural Editor *Country Gentleman*, says: "I am much pleased with its quality and appearance."

From the Editor of the *American Rural Home:* "Mr. J. S. Stone of Charlotte, recently left in our office samples of this almost unknown apple. The flavor is sprightly, sub-acid, good, and it is an apple that meets with ready sale in the market at the very highest prices paid for autumn apples."

From the Editor of the *Fruit Recorder:* "We pronounce it the finest market sort for September we have ever seen."

"The Stump Apple is truly a beauty."—S. E. TODD, Horticultural Ed. of *N. Y. Herald.*

"It is a very handsome, as well as a good eating variety, and ought to prove valuable for its season."—HOOPES, BRO. & THOMAS, Nurserymen, West Chester, Pa.

"The Stump Apple was pronounced very nice by all who tested it."—J. M. COBB, Yarmouth, Maine.

"It is of fine appearance and of excellent quality."—RAKESTRAW & PYLE, Nurserymen, Willowdale, Pa.

"MAX," in the *Fruit Recorder*, says: "It is the most beautiful apple I ever beheld. I fear with us [Va.] it will ripen in Peach season." He also writes in another communication, saying "the trees I ordered from you were the finest rooted I ever saw."

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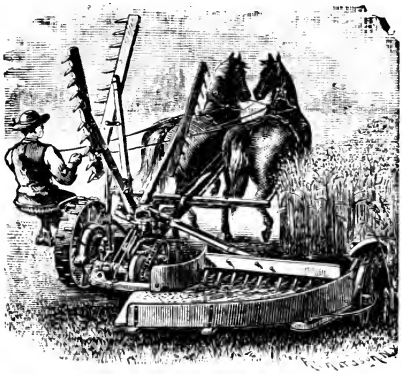

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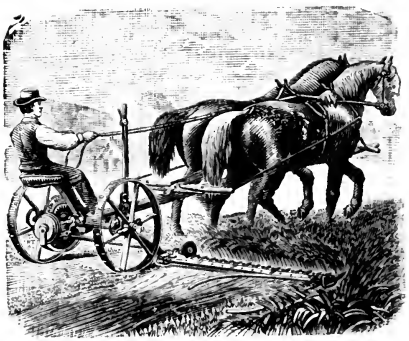

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